

# The IRON AGE

September 18, 1958

A Chilton Publication

The National Metalworking Weekly



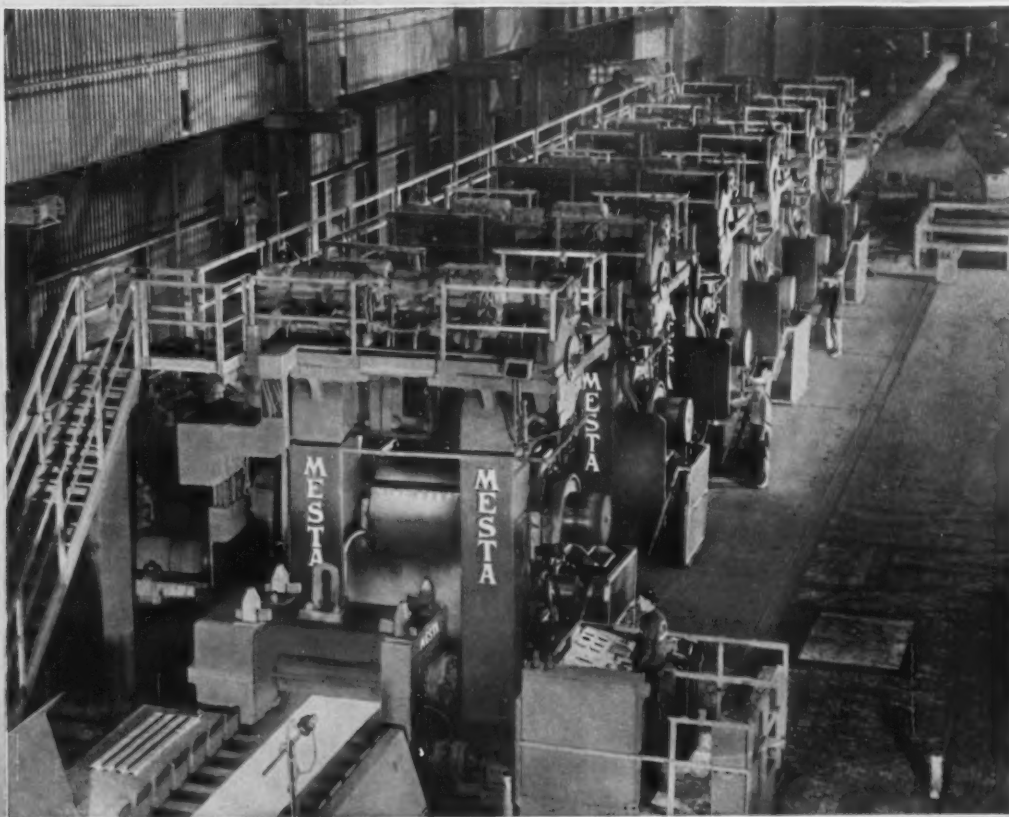
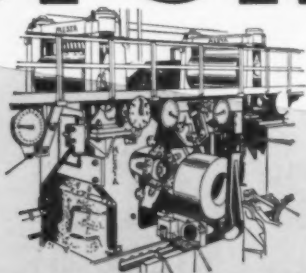
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In Deep Drawing  
Tool Steel P. 83**

**Should U.S. Fear  
New European Market? – P. 43**

**How Ceramics Cut At  
High and Low Speeds – P. 95**

**Digest of the Week – P. 2-3**

# HOT STRIP MILLS



MESTA 56" Four-High Hot Strip Mill for Rolling Stainless, Silicon, High-Alloy, and Carbon Steels at the Brackenridge Plant of Allegheny Ludlum Steel Corporation

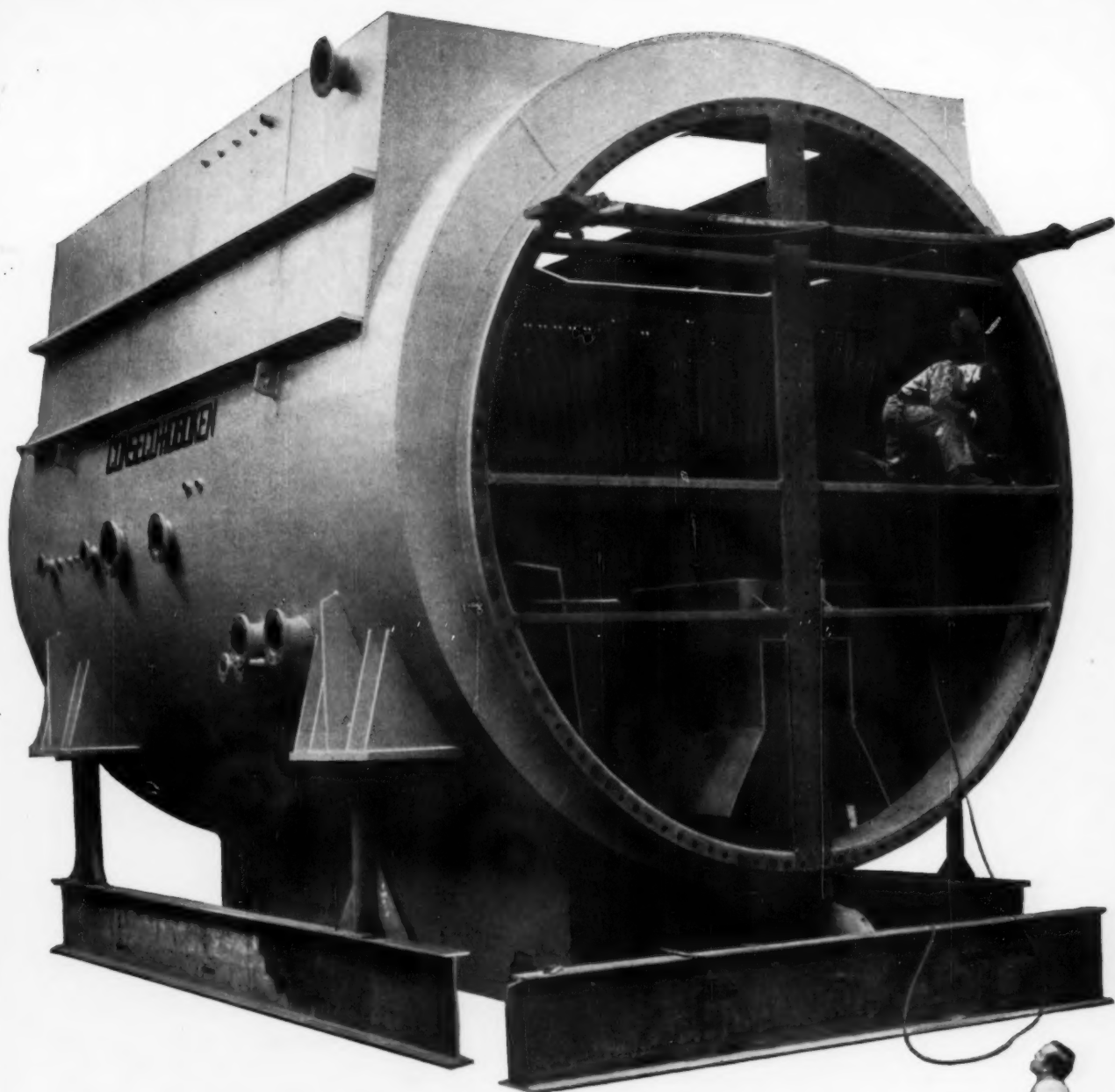


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**PITTSBURGH, PENNSYLVANIA**





## Steel Plates for 100-ton Condenser

Built for New York City Transit Authority, this big condenser is one of the largest recently fabricated by Condenser Service Corp., in their shops at Hoboken, N. J. Bethlehem plates were used in its fabrication.

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Indexed in Applied Science & Technology Index and Engineering Index.

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THE IRON AGE, published every Thursday

by CHILTON COMPANY, Chestnut & 56th

Sts., Philadelphia 39, Pa. Second class

postage paid at Philadelphia, Pa. Price

to the metalworking industries only or to

people actively engaged therein, \$5 for 1

year, \$8 for 2 years in the United States,

its territories and Canada. All others \$15

for 1 year; other Western Hemisphere

countries, \$25; other Foreign Countries, \$35

per year. Single Copies 50¢. Annual

Review Issue \$2.00. Cable: "Ironage,"

Philadelphia.

# The IRON AGE

September 18, 1958—Vol. 182, No. 12

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Doubt on That 7

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### NEWS ARTICLES

#### COMMON MARKET

Export Problems—Europe's  
Common Market will create pro-



blems for U. S. firms now doing  
business in the area. Tariffs will  
make exporting tougher, but new  
opportunities for operating abroad  
will develop. P. 43

#### INTEGRATED PILOT MILL

Abuilding at U. S. Steel—Add  
them together and the pilot plants  
throughout U. S. Steel's empire  
come close to making a complete  
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plants are planned. P. 46

#### GOVERNMENT SPENDING

New Stringent Policy—Certainty  
of a \$12 billion deficit this year  
and more to come, spells finis for  
unnecessary U. S. spending. Budget  
planners hope to have the deficit  
under control by 1961. P. 52

#### 1959 BUICK

Minus the Gingerbread—The  
new Buick will not be loaded down

# Metalworking



with chrome as in the past. New models will accent simplicity and clean body lines. P. 60

## LABOR RACKET PROBES

**More Are Coming**—Senate investigation into labor racketeering is far from dead. Despite pressure, McClellan will continue probes in 1959. P. 64

## FEATURE ARTICLES

### FIGHT CORROSION

**With New Pretreatment**—A new method chemically cleans a surface down to the bare metal, no matter how heavy the rust or mill scale. Then the metal is passivated, made non-conductive and primed in a single step. Cost depends on condition of the steel to be treated. P. 86

### IRON ORE SINTERING

**An Industry Trend**—The recent start-up of a new sintering plant spotlights a most important expansion item in the current steel picture. Its 2400-ton daily capacity is part of an industry-wide addition of 20 million annual tons for this year and next. P. 88

### TITANIUM

**Passes Ordnance Trials**—The bright hope is for slashing weight from structural elements of military vehicles. Current studies are mainly on welding, press forming, forging and machining. Problem is to

avoid surface embrittlement caused during heat treatment. P. 90

### DIRECT REDUCTION

**On a Small Scale**—A new direct reduction process for iron ore uses carbon as the reducing element and electricity as the energy source. Its unusual furnace design turns out a quality product. P. 92

### CERAMIC TOOLS

**At High and Low Speeds**—The push to use new cutting materials at higher speeds obscures the potential savings in using these materials at low speeds (1000 sfpm or less). In many cases, low speeds are actually the most efficient and economical. P. 95

## MARKETS & PRICES

### CHEMICAL INDUSTRY

**Expansion Coming**—The capital spending picture has suddenly changed for the chemical industry. A fourth quarter surge may bring 1958 totals close to last year's record. P. 48

## NEXT WEEK

### ADVANCING IN BUSINESS

**How to Help Yourself**—William B. Given, Jr., chairman, American Brake Shoe Co., outlines steps of self-improvement for the young executive. He lists qualities necessary for a successful executive, how to develop and use them to best advantage.

### DEEP DRAW TOOL STEEL:

Now it can be done. Research and shop skill teamed up for a major break-through. Showing two examples of drawn stainless casings is A. V. Murray, President, Scaife Co., the firm that provided production facilities. P. 83

### LINEPIPE SALES

**Due for Fast Comeback**—Linepipe ordering is still a hand-to-mouth proposition. But users may be back on a quota system in 1959. Some are booking tonnages as hedge against price increase. P. 49

### JOBBER PIPE DISCOUNTS

**Bitter Storm**—There's angry reaction from pipe jobbers on mill move cutting their discounts on direct shipments. Some jobbers feel mills are out to get more orders, not correct discount abuses. P. 50

### AUTOS AND STEEL

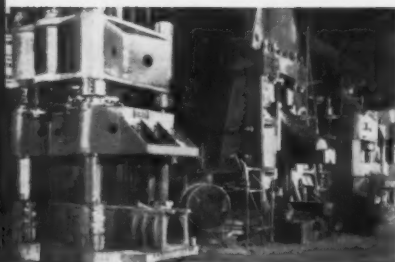
**Effect of Auto Strike**—A full-fledged auto strike wouldn't necessarily cripple the steel market. Demand from broad cross-section of industry would sustain it. P. 133

### OFFICE FURNITURE

**Features Material Blends**—Office furniture makers are turning to blends of wood, steel, aluminum, and plastics. Some firms offer free design service if their products are purchased. P. 134



*Meet the proud crew that operates*



The line-up, left to right: a 1500-ton hydraulic trimming press; a 50,000-pound steam drop hammer; a 3,000-ton pre-form press; a 750-ton blocking press.

## THE LARGEST PRIVATELY-OWNED FORGING HAMMER IN AMERICA!

They work at Park Drop Forge Company in Cleveland, and they handle this giant 50,000-lb. Erie steam drop hammer with such precision they claim they could crack a watch crystal without damaging its works!

To meet the rugged requirements of turning out 13-foot-long diesel crankshaft sections, Park Drop Forge looked to Erie Foundry for a complete installation of forging machines including hammer and presses.

If your requirements include forging machinery or rugged hydraulic presses, why not consult Erie Foundry Company?



The blocking press in action . . . first step in forging bar stock.



The snaking press makes a preform of the bar to prepare it for the hammer.



Now the mighty giant 50,000-lb. Erie hammer starts the work of forging the 13-foot crankshaft section.



In the Erie trimming press, the flash stays on top of die while forged shaft drops through.

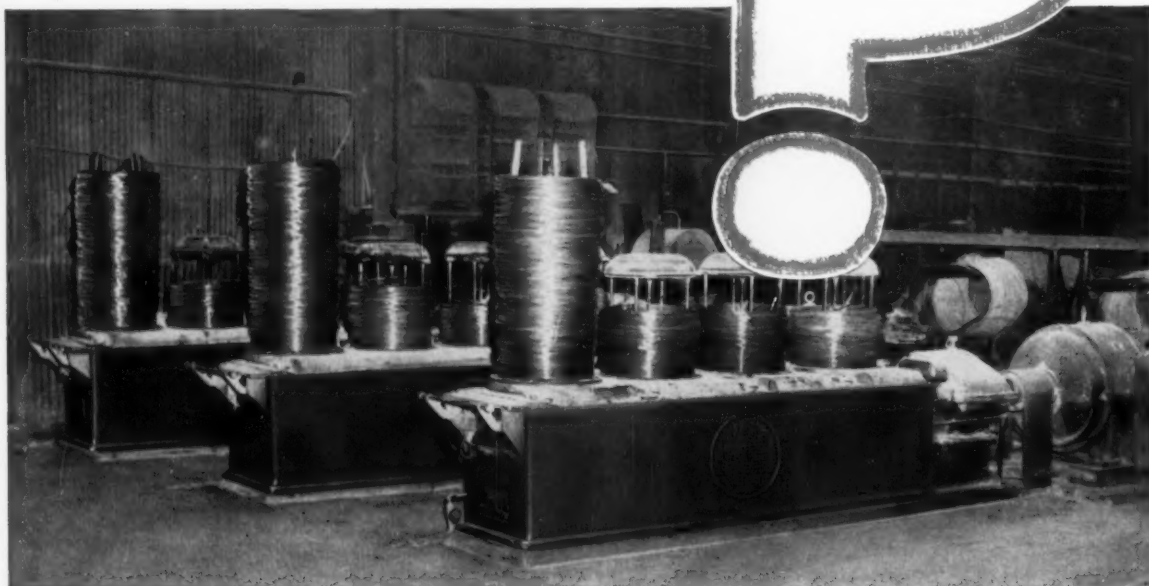
# ERIE

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since 1895

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ERIE, PA.



want **BIG**  
bundle capacity



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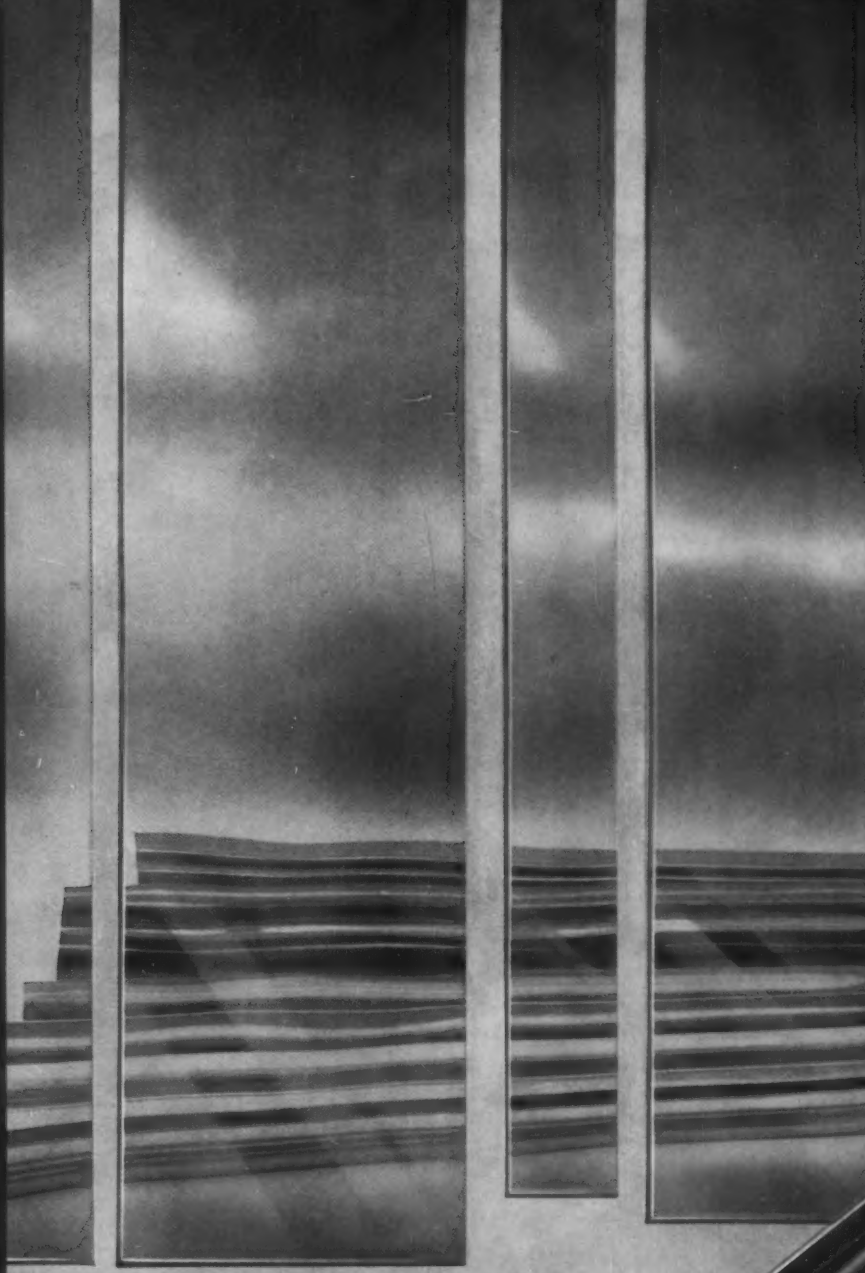
wire machines. The Morgan-Connor Machine is a nonslip, continuous, dry wire drawing machine. Morgan machines will give you maximum weight bundles at the lowest possible cost.

**MORGAN**  
WORCESTER

## **MORGAN-CONNOR** **WIRE MACHINES**

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# Leadership Reasserted: Ike Left no Doubt on That

Critics often oversimplify. But just as often they make some things over-complex. Then the use of words and what they mean to different people has a way of getting us tangled up.

At the risk of making things look too simple, the arguments made by President Eisenhower last week should be accepted as leadership of the highest type.

No leader is going to satisfy us all the time: If he did, he wouldn't be a leader. When he speaks out in strong and true terms and is not mealy-mouthed, we know where he stands.

There is no longer any doubt—if there ever was—concerning Ike's feelings about the two biggest bullies the world has ever seen: Russia and Red China. It is clear to many who were worried that our President is not being fooled by the aggressive hypocrisy of the two double-dealing dictators running those countries.

It should be clear, too, that Ike learned long ago that you have to call the bluff of international bullies just as you have to call the bluff of the high school bully.

Of course there is more at stake, but the principle is still the same: When the bully wins by bluff, he keeps taking on everyone whom he feels

can be trampled on. All bullies act alike.

The President did not say we were going to war. He did say we would fight aggression and would not be led down another Munich. Those who make this whole thing so complex start arguments about "a few islands" which are too small to warrant a war.

That sounds similar to past mistakes we have made. Perhaps we shouldn't be in the position we are in with regard to Quemoy and Matsu—but that's where we are. We can't back water in the face of a Red Chinese intention to take Formosa.

Many of us have hammered Ike for being too slow to take a position. Others have questioned his ability to see things in "broad" perspective. When he makes his position plain and simple we now have many who are afraid the world will be torn to shreds.

They worry also about our allies' stand on our position. We can't worry too much about that when we know our allies often like or don't like what we do for "home" political consumption.

Ike sounded as if he knew which end was up—and he needs our backing in the stand against world aggression. That's the simple fact.

*Tom Campbell*

Editor-in-Chief

# announcing another NEW HOBART WELDER VALUE

**HOBART**  
ac ac  
**POWER WELD**

DC WELDING ranges from 30 to 225 amperes

100% DUTY CYCLE: 200 amps. at 25 volts

SIMULTANEOUS AC POWER 1 to 2 KW when  
welding in lower ranges

5 KW FULL TIME AC POWER for emergency  
power when not welding

VISORED CANOPY protects controls

CONVENIENT CONTROLS all located on one panel

5 RANGE SWITCH and rheostat—no jacks

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AIRCOOLED smooth, quiet 2 cylinder Onan engine

COMPACT 38" long, 21¼" wide, 25¾" high

LIGHTWEIGHT 620 lbs. (approx.)



Portable mountings  
available at extra cost

**DC for welding.** This Hobart "PowrWeld" brings you all the advantages of DC welding in a compact design. It is independent of electric power supply, with a powerful air cooled engine that eliminates worry about freezing in cold weather. With this new DC Welder, you can handle all types of electrodes in all welding positions, having the advantage of being able to choose either polarity (straight or reverse) with which best results may be obtained on the job at hand.

**AC for auxiliary power.** From this same generator, you can operate tools that are most essential to the complete welding operation—such as lights, grinders, drills, chipping hammers, without leav-

ing the job for machine adjustments. **AC for full time power.** From the same generator, 5 KW AC power may be used to power many different types of electrical equipment, either permanently or on a "standby" basis in case of failure of regular power sources. Equipment such as grinders, drills, saws, lights, compressors, sprayers, vibrators, pumps, hoists, etc. Or—such farm equipment as incubators, brooders, milking machines, water pumps, lights, hay driers, refrigerators and many other items of electrical equipment in use on the farm today. Write today for complete details on this new combination unit. Hobart Brothers Company, Box IA-98, Troy, Ohio, Phone FE 2-1223.

The "PowrWeld" lets the operator change over from DC welding to AC power without leaving the work—without shouting instructions to a helper. He can take all his welding equipment and tools to the job and work uninterrupted until it is completed. Power to weld and power to use tools, alternately or simultaneously. The only combination of its type on the market today.

**HOBART**  
Manufacturers of the world's most complete line of  
**ARC WELDING EQUIPMENT**

You'll want  
to see and try  
this NEW  
combination welder  
and AC power unit.  
Use the coupon!

HOBART BROTHERS COMPANY, BOX IA-98, TROY, OHIO

- ☐ Rush complete information on the new DC Welder—  
AC Power Combination.  
☐ Would also like complete catalog on  
☐ Electrodes ☐ Accessories ☐ Other models of arc welders

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



## LETTERS FROM READERS

### Forging Dollar

**Sir**—Please send me a reprint of "How To Get More For Your Forging Dollar" appearing in the August 21 issue.

We found this article extremely informative and will undoubtedly refer to it often in the purchase of forgings.—T. B. Rees, Mgr.-Plant Purchases, The M. W. Kellogg Co., Jersey City, N. J.

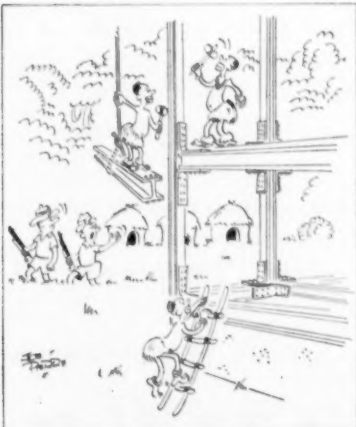
**Sir**—We were impressed with "How to Get More For Your Forging Dollar."

Since we deal with the sale of forgings we would be very much interested in having you send us a half dozen reprints for use by our salesmen.—Hugo A. Puls, Manufacturers' Agent, Birmingham, Ala.

**Sir**—Congratulations on "How to Get More For Your Forging Dollar," in the August 21 issue.

We would very much appreciate three additional copies.—A. Cohen, Metallurgical Planner, Canadian Pratt & Whitney Aircraft Co., Cartier, Canada.

**Sir**—We certainly enjoyed your article on forgings. We will appreciate it very much if we can have four reprints of this article.—B. H. Penwarden, Sales Mgr., Industrial Services Supply Co., Binghamton, N. Y.



"They're rather handy with their crude tools."

**Sir**—Our compliments on this very fine article. It is most informative and will be widely read. May we impose on you for six reprints.—P. V. Roberts, Peter V. Roberts Co., Sales Engineers, New York City.

### Russian Report

**Sir**—I see from your issue of Sept. 4 that your very excellent article on the Russian steel industry by Editor George Sullivan, a member of the American group which visited Russia in May and June of this year, is available for general distribution "as long as the supply lasts."

I should like to have copies, as many as you are prepared to send, for general distribution among our organization. This article is informative and extremely interesting, showing the development of Russian steel industry and its impressive plans for the future.—P. G. Shook, Pres., Shook & Fletcher Supply Co., Birmingham, Ala.

■ Copies are on the way.—Ed.

### Metals Info

**Sir**—In your Newsfront page of July 31 you mentioned two areas of great interest to us. One was the nickel base Ti-Al hardened alloy (Alloy to Boost Performance) and the other was commercial production of very high purity tantalum metal (For Liquid Metal Reactors).

Would you forward the addresses of organizations where we can obtain more detailed information.—G. W. LaPier, Commercial Development, Clevite Research Center, Div. of Clevite Corp., Cleveland.

■ About the item titled "Alloy to Boost Performance" you may contact Mr. Neal Haslett, GE Metallurgical Div., Detroit.

For additional information on the item "For Liquid Metal Reactors" you may write the National Research Corp., Cambridge, Mass.—Ed.



## IN FASTENERS SOUTHERN IS plated

For plated screws that assure corrosion resistance and beauty, you can rely on Southern's better finishes in plated nickel, zinc, cadmium, brass, copper, statuary bronze, blued or black oxidized screws. All of these are finished in our own plant to rigid specifications. Chromium plated brass wood screws, machine screws and nuts, and hot galvanized steel wood screws are stocked in all popular sizes.

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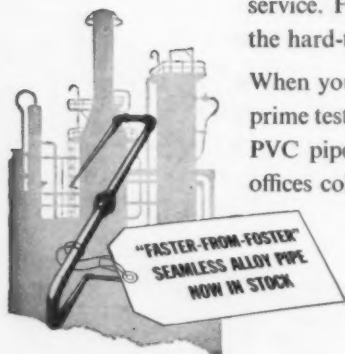
# "WHEN I NEED PIPE I Call L.B. FOSTER CO."



**...and a Foster truckload will be on the way immediately. Or a carload...or any quantity."**

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## FATIGUE CRACKS

### Aid for Weary Ears

If you attend conferences and conventions and get tired ears listening to long scientific papers don't despair. There may be a new era on the way.

Just imagine for a moment a meeting where no full technical reports are read in a buzzing monotone. Instead the authors limit themselves to brief abstracts, followed by an opportunity for audience questions.

During these a topic can be explored in depth beyond that of the paper, if required. If the author and questioners want even more time for discussion an evening session can be arranged.

There are other innovations at our "ideal" meeting. No formal lunches or dinners are held. There are no exhibits. What's more, the sessions are open to everyone, regardless of business, trade, or association affiliations.

Sound good? Well the meeting described is not imaginary. The plan outlined will be followed at the 3rd Electronic Industries Association Conference on Reliable Electrical Connections. It will be held at the Statler Hilton Hotel in Dallas, Texas early this December.

Congratulations on your approach, EIA. Hope it's a success.

### Word from Detroit

This is the time of year when auto industry advertising and public relations men work overtime getting out press kits on the new cars.

From our Detroit man comes word about Chrysler's contribution this year. It's heavier than the 1958 press kit—21 ounces compared with a previous 15½ ounces.

There are also more pictures (16 this year as against 12 last year), more stories (14 instead of 11), and more pages (75 contrasted with 52).

### Hail Florian Dauenhauer

When America's ale and beer drinkers lift their steins, says Steelways magazine of the American Iron and Steel Institute, they should toast Florian Dauenhauer of Santa Rosa, Calif.

The reason? Dauenhauer has solved an 80-year industrial problem by inventing a successful mechanical hop picker. Since hand picking the hops—which give beer and ale its bouquet—costs about 16 cents a pound this is no small feat. With the new machine the picking price will drop 2 or 3 cents a pound.

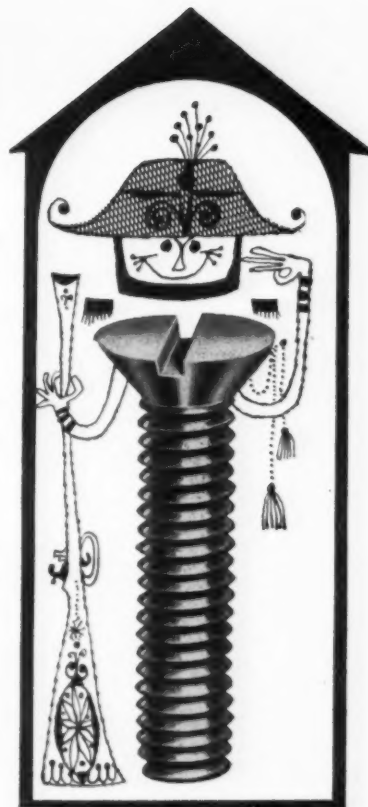
Dauenhauer started with a machine made of wood, switched to one of steel later on.

### Fashion Note

We can't let the summer pass without this thought on metalworking's contribution to suntanning. Aluminum foil, we're told, provides sun-loving gals an easy way to get tailor-made suntan designs. For a stenciled suntan they just cut the foil in the pattern wanted, wrap it around the area to be tanned and relax under Ol' Sol.



"Our last contract caught us a little shorthanded. . . ."



## GUARD AGAINST CORROSION WITH ALCOA ALUMINUM FASTENERS

Whatever you make, make it better of aluminum and fasten it with Alcoa® Aluminum Fasteners. Guard against both galvanic and atmospheric corrosion and get lasting sales appeal with bright, carefree aluminum fasteners. For your requirements, call your nearest Alcoa sales office. Complete stocks of all standard types and sizes of Alcoa Aluminum Fasteners are on hand at your local Alcoa distributor. Look in the Yellow Pages of your telephone directory.



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and samples of Alcoa Aluminum Fasteners.  
Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_

# Automatic Positioning

Reduces  
Production Costs with

**BULLARD**

**H.B.M.**  
MODEL 75



The experience of George Hantscho Company, Inc., Mount Vernon, New York, builders of equipment for the printing industry, is typical of that enjoyed by users of Bullard H.B.M., Model 75.

## THE PROBLEM

To bore 105 holes, from 5" to 1/2" in diameter, in both side frames of paper folding machine to support rollers, gears and folding cylinders. Some holes must be aligned vertically and others horizontally.

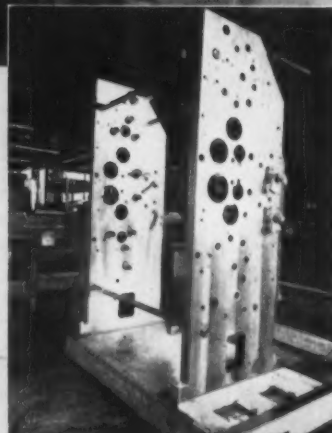
## THE SOLUTION

Mount pair of side frames, 5/8" apart, on table of 4" Bullard H.B.M., Model 75, equipped with automatic table and head positioning. Bore all holes of the same size beginning with the largest and working down to the smallest.

## THE ADVANTAGES

All related holes in perfect alignment — no spoilage. Less tool change-over time.

Eliminate hand measurements and templates for hole location. Accurate automatic hole location within a tolerance of  $\pm .0004"$ . Ease of operation from Pendant Control — less operator fatigue. Overall boring time reduced 25% over previous method.



Partially assembled side frames ready for ink rollers, gears and printing cylinders.

How about your boring problems? Are you applying all the advantages of a Bullard H.B.M., Model 75 to them? If not — get the full story from your nearest Bullard Sales Engineer or write

**THE BULLARD COMPANY**

**BRIDGEPORT 9, CONNECTICUT**



## COMING EXHIBITS

**Iron & Steel Show** — Sept. 23-26, Cleveland Public Auditorium, Cleveland. (Association of Iron & Steel Engineers, 1010 Empire Bldg., Pittsburgh 22, Pa.)

**Western Tool Show** — Sept. 29-Oct. 3, Shrine Exposition Hall, Los Angeles. (American Society of Tool Engineers, 10700 Puritan Ave., Detroit 38.)

**Packaging & Materials Handling Show**—Oct. 14-16, Coliseum, Chicago. (SIPMHE, 327 LaSalle St., Chicago 4.)

**Metal Show** — Oct. 27-31, Public Auditorium, Cleveland. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

**Plastics Show**—Nov. 17-21, International Amphitheater, Chicago. (The Society of the Plastics Industry, Inc., 250 Park Ave., New York 17.)

## MEETINGS

### SEPTEMBER

**Steel Founders Society of America** —Fall meeting, Sept. 22-23, The Homestead, Hot Springs, Va. Society headquarters, 606 Terminal Tower, Cleveland 13.

**Standards Engineers Society**—Annual meeting, Sept. 22-24, Benjamin Franklin Hotel, Philadelphia. Society headquarters, P. O. Box 281, Camden 1, N. J.

**The Material Handling Institute, Inc.**—Joint industry fall meetings—Sept. 22-24, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, Suite 759, One Gateway Center, Pittsburgh 22.

**Air Moving & Conditioning Assn., Inc.**—Annual meeting, Sept. 22-25, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 2159 Guardian Bldg., Detroit 26.

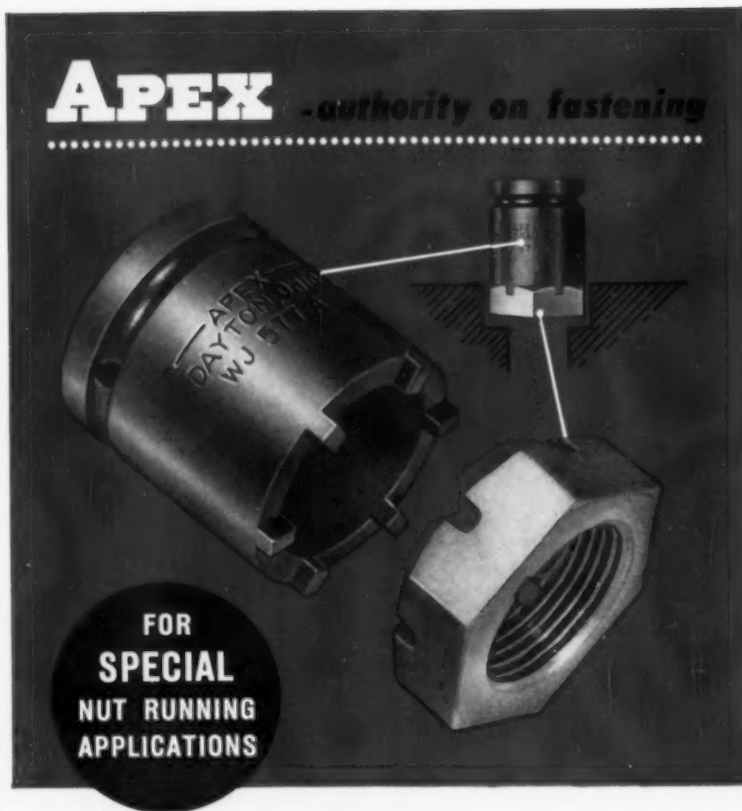
**Porcelain Enamel Institute** — Annual meeting, Sept. 25-27, The Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 1145 19th St., N. W., Washington, D. C.

(Continued on P. 16)

# APEX

*-authority on fastening*

---



FOR  
SPECIAL  
NUT RUNNING  
APPLICATIONS

Routine equipment maintenance in a midwestern factory requires frequent removal and replacement of castellated nuts of various sizes. Standard sockets can't be used for this work, as each nut fits snugly into a deep, narrow recess.

This job used to be done, after a fashion, with a hammer and chisel. Now, Apex special sockets, specifically designed and built for this application, are used. The Apex method is faster, safer and cheaper . . . and it eliminates costly damage to tools and fasteners.

Almost everyone knows that, at Apex, "we quote promptly on specials" . . . and we produce and deliver just as promptly. On your special fastening problem, why not ask Apex for the answer?

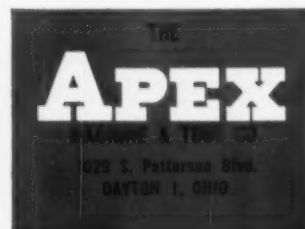
FOR  
STANDARD  
NUT RUNNING  
APPLICATIONS

Apex has the specials . . . plus more than 5,000 stock sizes and types of nut running tools as well. Wherever there's a nut running job, Apex Catalog 29-R is needed. Write, on your company letterhead please, for your copy.

1933

*A Quarter Century of Service to Industry*

1958



# RIVETING REVOLUTIONIZED by the **PAR** PROCESS!

**PAR** ... Originated by TRS with the invaluable collaboration of some of industry's top production engineers who sought a major break-through in the automation of assembly operations to reduce costs.

**PAR** ... A name given by TRS to its Production Automated Riveting process ... continuously developed and perfected for 3 years. Proved successful in some of industry's most efficient plants. Now, TRS has sufficient engineers especially trained in the PAR process to serve all manufacturers.

**PAR** ... It makes riveting practically a new fastening method through efficiently integrated and automatic ...

1. FEEDING of tubular rivets or related products.

2. TRANSFER of parts between riveter stations by means of sliding or rotating fixtures or dial tables. Or through synchronization with conveyors.

3. SEQUENCING the operation of from 3 to 15 rivet setters which make all fastenings simultaneously or in any desired sequence.

4. CONTROL of setting force as required by parts thickness or material characteristics.

5. SENSING of improper conditions and stopping equipment to avoid injury to parts, equipment or operator.

6. EJECTION of parts as required.

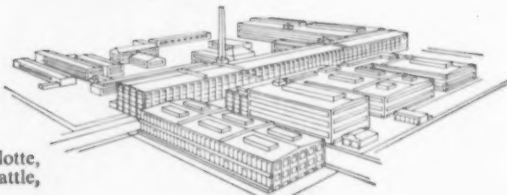
# TRS<sup>®</sup>

**TUBULAR RIVET & STUD COMPANY**

QUINCY 70, MASS.

See us at the **NATIONAL METALS EXPOSITION**

Midwest Office & Warehouse in Chicago. Branches: Atlanta, Buffalo, Charlotte, Dallas, Detroit, Indianapolis, Los Angeles, New York City, Philadelphia, Seattle, St. Louis. See "Yellow Pages" for phone numbers.





# FORD

*almost tripled production  
—without adding to payroll*

Ford engineers wanted to step-up the production rate on a window gear and cam assembly. They called in TRS engineers.

Here is the remarkable automatic TRS Machine that resulted. Because center distances would not permit employment of a Multi-Head Riveter, a triple drive machine was adapted by TRS engineers. This eight dial station set-up receives a gear and cam assembly . . . greases it . . . receives a shaft and housing . . . sets three rivets to fasten shaft and housing to the gear and cam unit . . . ejects complete assembly. The machine does everything but load the parts.

Ford Motor Company know-how shows in the profitable solution . . . so does TRS ingenuity and experience.

**You get the benefit of TRS "recognized ability"** when you buy any TRS Riveting Machine . . . from the simplest, standard type to a complicated special design.

**TRS offers more machines,** to more exactly meet your need . . . will lease but likes to sell . . . guarantees performance and sticks by you with all-out service.

## PAR . . . It's a TRS Process for very good reasons!

Obviously, there are two critical elements in the PAR Process. Essential is the special and extensive knowledge and experience needed to design an integrated system of standard or multi-head riveters, feeders, transfers and controls for the particular assembly involved. Equally important are superior knowledge and experience in the design, tooling and application of Multi-Head Riveters because these are usually employed.

TRS originated Multi-Head Riveters over three years ago and is the only experienced source of these machines. Further, because this TRS development opened up new possibilities for automating the riveting pro-

cess, TRS was able to begin three years ago to develop the special experience and application engineers required to fully meet the requirements of the PAR Process.

## PAR . . . A New Opportunity to Reduce Direct Labor Charges

With this new help, hundreds of manufacturers . . . large and small . . . can effect substantial savings in direct labor charges, increase production rates, decrease parts spoilage and machine down-time. Look into it now if your product can be riveted, and especially if several rivets are involved.

The yearly amortized cost of the TRS Multi-Head Riveter equipment is low because it will not be obsoleted by changes in product design or production line.

**To save more . . . To protect against equipment obsolescence . . . don't buy any Riveting Machines until you investigate the PAR Process**



**You're not required to use TRS Rivets but you'll be better off if you do**

There are no contracts or obligations involved in the PAR Process. However, it is true that the more automatic you make your riveting, the more important it is to use rivets that reduce operating troubles and machine down-time. And, we can give you good, factual reasons why TRS Tubular Rivets are more reliable in essential qualities and uniformity. Ask for the facts . . . judge for yourself.

Advt. Copyright by Tubular Rivet & Stud Company, 1958



# VALVOLINE

# TECTYL

rust preventives  
protect u.s. army tanks  
in storage...

*Tectyl 894 is applied to the interior of tank engines... which are filled, then drained, leaving a protective rust preventive film.*

The following Valvoline Tectyl Rust Preventives are regularly used by the Chrysler Corporation Delaware Defense Plant, at Newark, Delaware.

**TECTYL 894** — Protects critical bare steel or phosphated surfaces for extended periods while in storage... also protects interior surfaces of machinery, instruments or material under cover. For use where water or a saline solution must be displaced from corrodible surfaces.

**TECTYL 858** — An automotive and artillery corrosion — resistant grease. For use under all conditions of service where ambient temperatures range from minus 65 degrees F. to plus 125 degrees F.

**TECTYL RUST PREVENTIVES** are petroleum-based coatings with chemical additives. Easy to apply and remove... will spread evenly... can be brushed, dipped or sprayed.

**There are many highly specialized TECTYL formulas. Write TODAY for information and advice without obligation. Describe metal and types of exposure.**

1A-958

## Valvoline Oil Company • FREEDOM, PENNSYLVANIA

### Division of ASHLAND OIL & REFINING COMPANY

DISTRICT OFFICES: New York City • Cincinnati • Detroit • San Francisco • Los Angeles  
Seattle • Portland — and Toronto and Vancouver in Canada.



*U. S. Army tanks just completed at the Delaware Chrysler plant, shown on way to storage yard and a TECTYL rust preventive coating.*

## EXHIBITS, MEETINGS

(Continued from P. 13)

**The Electrochemical Society, Inc.**—Semi-annual meeting, Sept. 28-30 and Oct. 1-2, Chateau Laurier, Ottawa, Canada. Society headquarters, 1860 Broadway, N. Y.

**Pressed Metal Institute** — Annual meeting, Sept. 28 - Oct. 2, The Cloisters, Sea Island, Ga. Society headquarters, 3673 Lee Rd., Cleveland 20.

**National Screw Machine Products Assn.** — Executive seminar, Sept. 30-Oct. 1, Brock-Sheraton Hotel, Niagara Falls, Canada. Society headquarters, 2860 E. 130th St., Cleveland.

### OCTOBER

**National Assn. of Sheet Metal Distributors**—Fall meeting, Oct. 5-8, Marlborough Blenheim Hotel, Atlantic City. Society headquarters, 1900 Arch St., Philadelphia.

**Truck Body & Equipment Assn., Inc.**—Annual convention and exhibit, Oct. 6-8, Ambassador Hotel, Atlantic City. Society headquarters, 1616 K St., N. W., Washington, D. C.

**Gray Iron Founders' Society, Inc.** —National annual meeting, Oct. 8-10, Sheraton-Park Hotel, Washington. Society headquarters, 930 National City-E 6th Bldg., Cleveland.

**The Wire Assn.**—Annual convention, Oct. 13-16, Chalfonte-Haddon Hall, Atlantic City. Society headquarters, 543 Main St., Stamford, Conn.

**Hoist Manufacturers Assn.**—Membership meeting, Oct. 14, Warwick Hotel, Philadelphia. Society headquarters, One Thomas Circle, Washington 5, D. C.

**American Machine Tool Distributors' Assn.**—Annual meeting, Oct. 15-17, Sheraton Plaza, Boston. Society headquarters, 1900 Arch St., Philadelphia.

**Rail Steel Bar Assn.**—Semi-annual meeting, Oct. 20-22, Blackstone Hotel, Chicago. Society headquarters, 38 S. Dearborn St., Chicago.





## Big Paul digs and dumps 105 tons in 50 seconds!

**USS** "T-1" and TRI-TEN Steels  
cut dead weight—boost strength

Even from a 100-foot-high perch, the mammoth size of the bucket of Big Paul, the King of Spades, is hard to comprehend.

There are three of these 70-yard giants—all built by Marion Power Shovel Company. All achieve strength and toughness with least weight by the use of USS "T-1" Constructional Alloy Steel and USS TRI-TEN High-Strength Low-Alloy Steel.

Big Paul sets the pace at the Peabody Coal Company's River King mine near Freeburg, Illinois. It rams through rock and shale to uncover some two million tons of coal per year.

Since 1950, the art of big shovel making has increased dipper size from 35 to 45, 55, 60, and now 70 cubic yards per bite. Most of the buckets and dipper sticks of these giant shovels are made of USS "T-1" Steel, for otherwise, it would be almost impossible to make them light enough and tough enough. They hold up in this service, taking terrific impact abrasion and shock loading, even in the dead of winter. This is possible because USS "T-1" Steel retains its toughness at temperatures far below zero.

### Dipper Size Increased 25%

USS "T-1" Steel has often enabled a boost in the capacity of original equipment without increasing weight. For example, a 20-yard bucket was replaced with a 24-yard "T-1" Steel job. Other dippers were boosted from 26 yards to 32, and 36 yards to 45—increases of 25%.

Many other parts—dipper stick, bail handles and crowd rack—are built stronger and lighter with this 90,000 psi minimum yield strength constructional alloy steel. (USS "T-1" Steel plates up to 2½ inches thick inclusive are now available with a minimum yield strength of 100,000 psi.)

The booms and A-frames of most shovels over 45 yards are designed with high-strength low-alloy steels with 50,000 minimum yield point . . . usually USS TRI-TEN Steel.

Perhaps you need a steel that offers higher yield strength, extraordinary toughness and resistance to impact abrasion, combined with relative ease of fabrication. USS "T-1" Steel is your answer, and we'll gladly help you adapt it to your application. For free booklet, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania

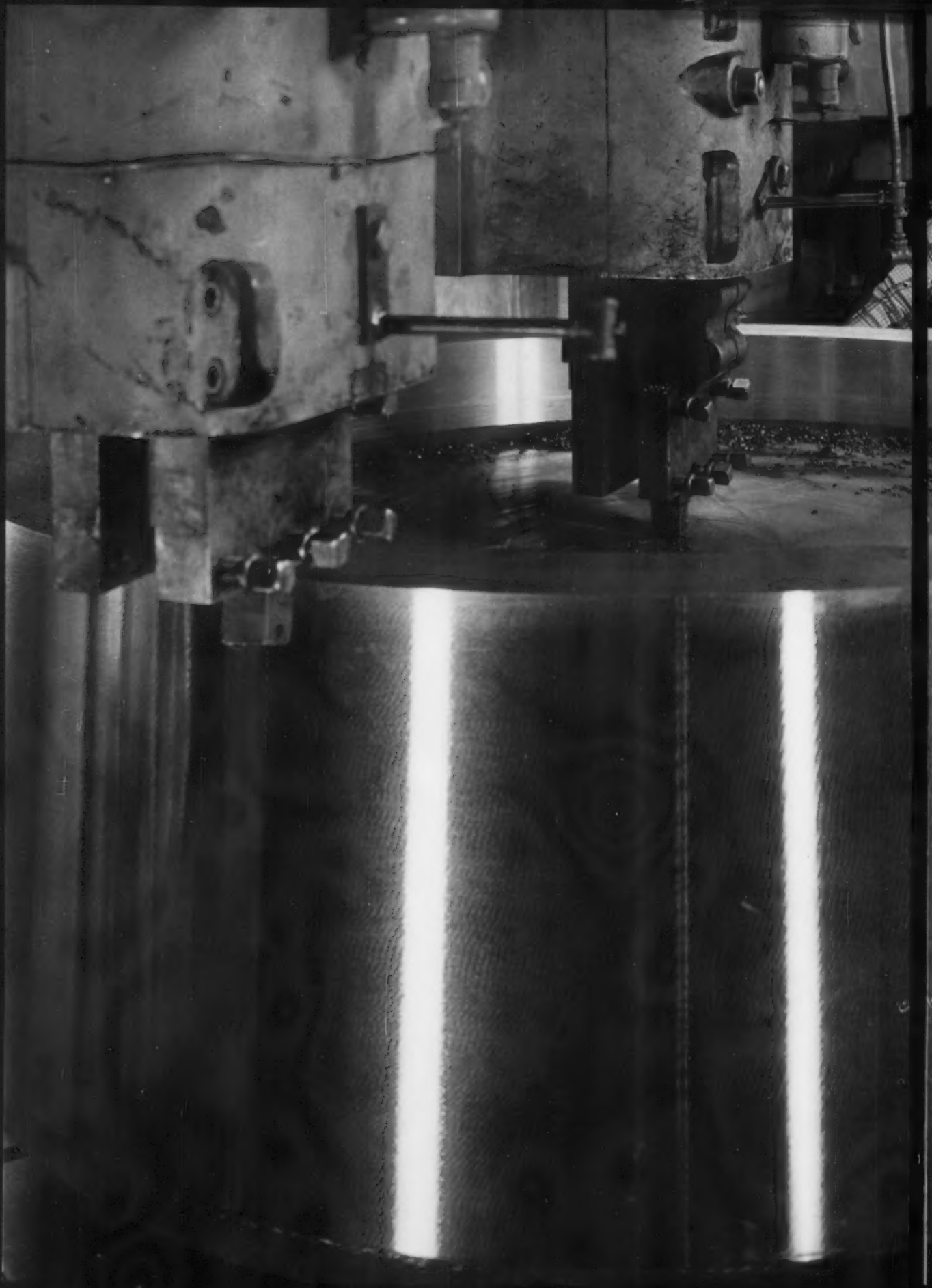
*USS, "T-1" and TRI-TEN are registered trademarks*

70-yard dipper and handle, crowd rack, bail and sheave blocks—all built stronger and lighter with USS "T-1" Steel.



United States Steel Corporation - Pittsburgh  
Columbia-Geneva Steel - San Francisco  
Tennessee Coal & Iron - Fairfield, Alabama  
United States Steel Supply - Steel Service Centers  
United States Steel Export Company

**United States Steel**





## 12 tons of forged steel for Yankee fission

The picture shows a steam generator tube sheet forging (one of four) destined for a 134,000-KW nuclear-fueled power plant owned by the Yankee Atomic Electric Company, in Rowe, Massachusetts.

It's a \$50-million plant that uses a pressurized water reactor. The USS Quality Forging tube sheet is 85" in diameter by  $26\frac{7}{16}$ " thick. Some 1600 holes will be drilled through the forging longitudinally, and in these holes will be placed stainless steel tubes which will carry high pressure, high temperature main coolant water.

The forged tube sheet is made from carbon steel with a pinch (.057%) of vanadium in it. Starting from the raw ingot, it was heated, forged, rough machined, normalized, tempered, rough machined again, then quenched and tempered. It received a great variety of tests along the way—including several ultrasonic tests. The forging, as shipped, weighed 25,500 pounds.

Nuclear power plant designers have known from the beginning that it is extremely important to use highest quality components. That's the reason why they come so often to United States Steel for its justly famous USS Quality Forgings. And although the one shown here is not complicated, the Forgings Division of USS Homestead District Works has produced a great many complex forgings in everything from carbon to stainless steel, including discs, tapered domes, flanges and cylinders of all types.

No matter what kind of a forging you need, isn't it a good feeling to know that the men who will make it have a solid background of experience? We'd appreciate your inquiries or requests for our free folder on USS Nuclear Forgings. Just write United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

*USS is a registered trademark*



United States Steel Corporation - Pittsburgh  
Columbia-Geneva Steel - San Francisco  
Tennessee Coal & Iron - Fairfield, Alabama  
United States Steel Export Company

## United States Steel

# ATLAS LUMNITE

## IN REFRACTORY CONCRETE DOME:



Circular Revolving Hearth Furnace featuring an unusual inner dome constructed with a castable refractory bonded with LUMNITE calcium-aluminate cement. Furnace diameter is 17 feet; 9" thick concrete dome has 289 holes (5" diameter). Heat passes downward through dome openings to anneal shells in furnace.

### ... for low cost furnace construction and maintenance

- Refractory concrete (with ATLAS\* LUMNITE cement) stands up under continuous soaking heat . . . protects against thermal shock due to heating-cooling cycles . . . provides insulation.
- Easy, economical to place . . . by precasting, troweling or guniting . . . concrete reaches high strength 24 hours after placing.

For maximum convenience, use castables made with LUMNITE\* cement. These are packaged mixtures, ready for use. Simply add water, mix and place. Made and distributed by leading manufacturers of refractories.

Write for "Lumnite Refractory Concrete Manual"—  
Universal Atlas, 100 Park Avenue, New York 17, N. Y.



Universal Atlas Cement  
Division of United States Steel



\*TRADE MARK

L-176

OFFICES: Albany • Birmingham • Boston • Chicago • Dayton • Kansas City • Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • St. Louis • Waco



**SENSITIVE, RUGGED, VERSATILE—  
TOPS FOR ALL-ROUND PRODUCTION**

## **THE ALL-NEW "BUFFALO" NO. 15 DRILL**

The totally-new "Buffalo" No. 15 Drill combines brand new "easy-to-operate" features with the time-proven advantages earned by industry's choice for over twenty-five years.

The No. 15 has always been famous for its extreme sensitivity, which ideally suits it for small hole drilling. At the same time this versatile drill is sufficiently rigid and heavy to operate at full capacity without undue strain or wear.

New "Buffalo" No. 15 Drill Features Include:

- Front-Mounted Start-Stop Switch.
- Easily-Read Speed Range Table.
- Graduated Depth Gauge.
- Proper Belt Tension is Automatically Maintained.
- Belt Guard Tilts Upward to Simplify Speed Changes.

All these and many more notable improvements are yours with the new "Buffalo" No. 15 Drill. The No. 15 line includes bench, floor and pedestal models. Bench and pedestal types are available in 1- to 6-spindle models. Attachments for tapping,

mortising, routing or spot-facing may be ordered. Your nearby "Buffalo" machine tool dealer will be glad to arrange a demonstration of the No. 15 Drill. Contact him today, or write us direct for Bulletin No. 4024.

*"Buffalo" products bring you the famous "Q" Factor — the built-in QUALITY which provides trouble-free satisfaction and long life.*



**BUFFALO FORGE COMPANY**

492 Broadway • Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

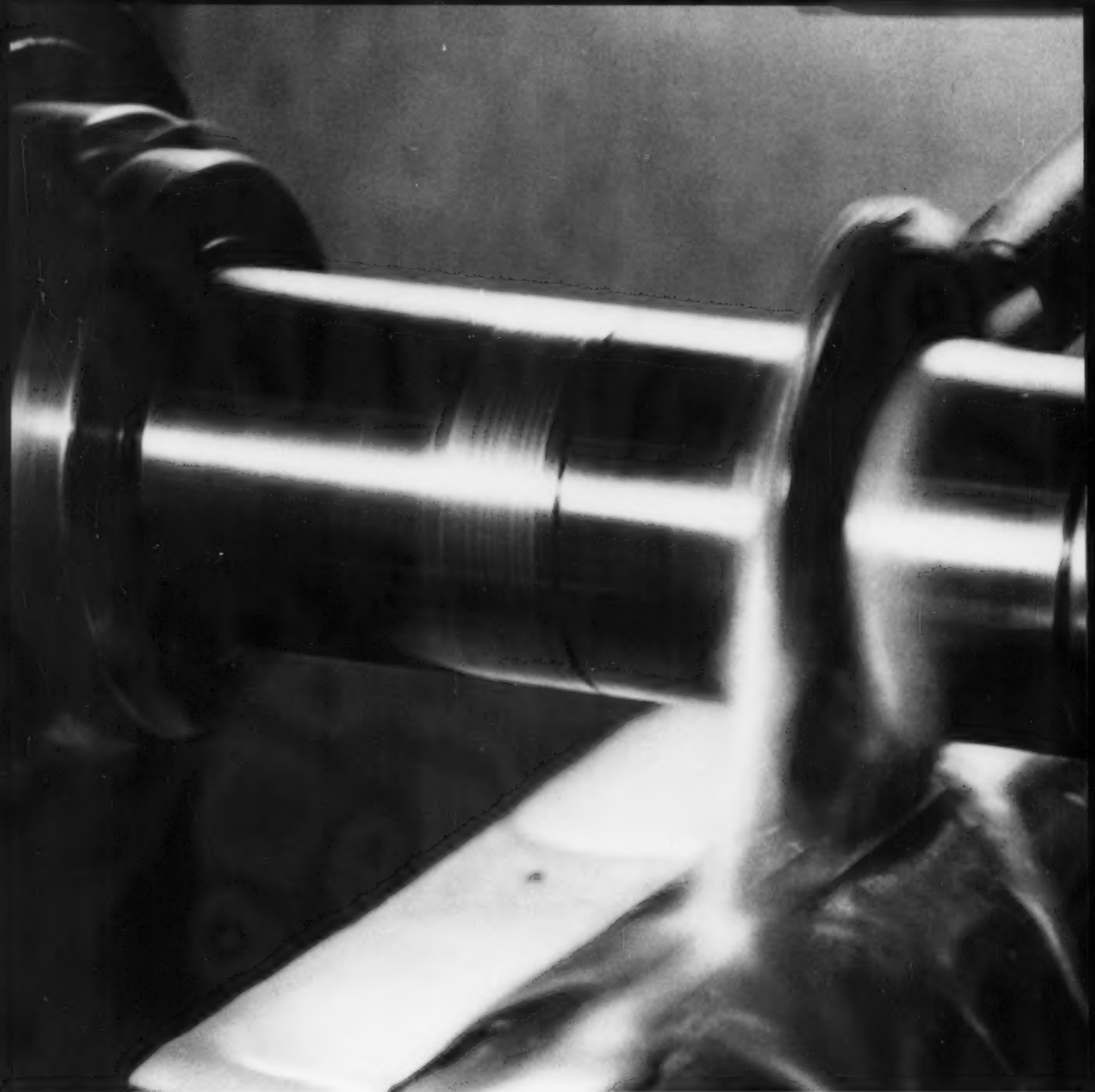
DRILLING

PUNCHING

SHEARING

BENDING





Cutting oil life jumped from 3 weeks to 3 months . . . tool life

## GULF MAKES THINGS

At its Milford, Conn. plant, U.S. Electrical Motors turns out a complete line of motors ranging from  $\frac{1}{4}$  to 250 hp, all precision built. For much of their close-tolerance machining they utilize emulsifying oils. Says Theodore O'Connor, Plant Superintendent:

"Until recently, we were using a soluble oil mixed in a 20-to-1 water-oil ratio to cut keyways in a variety of motor shafts. Then we switched to Gulfcut Heavy Duty Soluble Oil mixed 35-to-1. Service life of the cutting

oil on this job jumped from 3 weeks to 3 months!

"The new mixture provides much better cooling. It has doubled our tool life. And we now hold closer tolerances—to plus or minus .001 on this operation."

### HAVE YOU TRIED GULFCUT HEAVY DUTY SOLUBLE OIL?

Long and economical service life is only part of the story. This versatile oil has performed efficiently even when mixed in a 150-to-1 ratio! Its lubricating-cooling-pro-



**U.S. ELECTRICAL MOTORS Inc.** doubled tool life on this milling machine with Gulfcut Heavy Duty Soluble Oil. Keyway cut in the steel shaft is 4 $\frac{1}{4}$ " long;  $\frac{3}{8}$ " wide;  $\frac{3}{16}$ " deep. Speed 6.8 inches per minute milled. Tolerances held to  $\pm .001$ . Pictured here are Theodore O'Connor, Plant Superintendent, and Peter Eaton, Gulf Sales Engineer.

doubled . . . more proof that

# RUN BETTER!

protective properties meet a great variety of heavy duty machining needs, even in turning chrome-nickel steels and other tough alloys. It makes possible higher speeds, deeper cuts, finer finishes. It offers greater protection against corrosion and unusual resistance to rancidity. It will prove to you that Gulf makes things run better!

Get the full efficiency-economy story on new Gulfcut Heavy Duty Soluble Oil now. Call your Sales Engineer, at your nearest Gulf office, or mail coupon.

#### GULF OIL CORPORATION

Dept. DM, Gulf Bldg., Pittsburgh 30, Pa.

Send me illustrated bulletin on Gulfcut Heavy Duty Soluble Oil.

Name

Title

Company

Address

City  Zone  State



# "LET'S PUT IT UP TO ROSS"

**"they build the biggest variety of exchangers and condensers in the business"**

Companies large and small throw a volley of heat transfer curves at Ross and get time-saving, cost-cutting answers. Operating on a "you name it, we'll do it" basis, Ross has designed and built practically every type and size of heat exchange equipment in use today.

By putting top engineering brains to work on routine as well as highly specialized assignments, Ross has racked up a string of "firsts" that date back to 1917.

Today, with a large new plant in operation, this team of specialists is ready to custom build or mass produce on a *greater scale than ever before*. A division of

American-Standard\*, Ross Heat Exchanger is geared to deliver the goods, from miniature oil coolers to mammoth field-erected surface condensers.

The next time you've got a heat transfer problem, put it up to Ross early in the game. Meanwhile, get a closer look at Ross men, facilities and products. Write for new illustrated booklet **"THIS IS ROSS—READY FOR YOU."**

American-Standard, Ross Heat Exchanger Division, Buffalo 5, N. Y. In Canada: American-Standard Products (Canada) Ltd., Station D, Toronto, Ont.

\*AMERICAN-Standard, and Standard ® are trademarks of American Radiator & Standard Sanitary Corporation.



## AMERICAN-Standard

ROSS HEAT EXCHANGER DIVISION



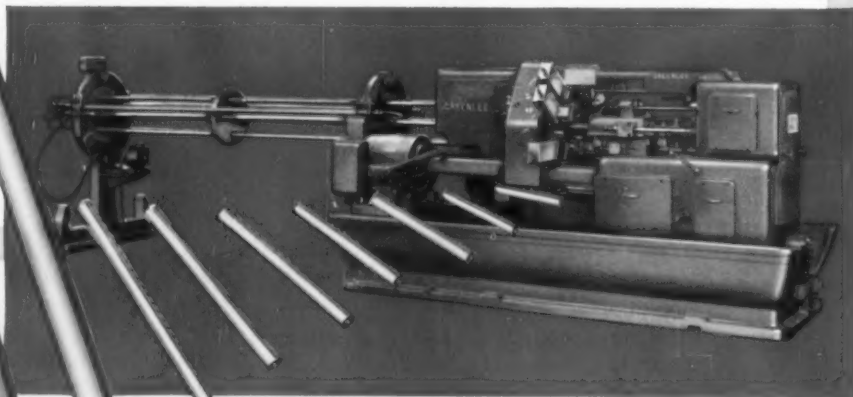
PRODUCTION MACHINERY

**GREENLEE**



## AIR-FEED AUTOMATICS

Eliminate Stock Pushers...  
Eliminate Scoring of Stock...  
Provide For Extra Length Feed-Out...  
Reduce Downtime During Set-Up



### MULTIPLE FEED-OUT

**Permits Greater Job Versatility  
and Added Profits**

#### Greenlee Standard and Special Machine Tools

Multiple-Spindle Drilling  
and Tapping Machines

Transfer-Type Processing  
Machines

Six and Four-Spindle Auto-  
matic Bar Machines

Hydro-Borer Precision  
Boring Machines

Greenlee Air-Feed Automatics give you a competitive edge. The multiple feed-out arrangement offers a distinct profit advantage in machining many types of parts. Threads and oil grooves may be rolled on any portion of long shafts. Finish forming may be done on either end. See your Greenlee Distributor. He'll show you how Greenlee Air-Feed Automatics will pay off for you.

Write today for Catalog A-405 —  
first step on the way to more profitable production  
with Greenlee Automatic Bar Machines.



**GREENLEE**

BROS. & CO.

1809 MASON AVE.  
ROCKFORD, ILL.

# A Report on the

## Ten basic attributes that can help you satisfy both design and production needs.

The properties of copper alloys are a hand-book in themselves. No group of metals is more versatile. Here are electrical, thermal, structural, chemical and finish properties that are unique. Here are metals that can be shaped and joined by almost every known method.

There are over 40 standard alloys of copper. And each has its own set of specifications, its own combination of properties. Finding the one that best matches *your* specifications is the problem. And the answers to that problem keep changing. Copper industry research into new alloys and new forming and preforming methods gives designers a latitude today that challenges both their imagination and their ability to keep posted. Today we must assume that some copper alloy *can* do the job.

Here are just ten of the more important design requirements that point to the selection of a copper alloy:

### 1.

**Electrical Conductivity.** The various types of commercially pure copper have long been the most economic conductors. Now, copper-chromium and copper-cadmium alloys have improved mechanical properties along with high conductivity. And silver-bearing coppers with as good conductivity as commercially pure copper have a higher softening tempera-

ture for certain applications involving high temperatures.

### 2.

**Thermal Conductivity.** Since many of the low-zinc brasses, as well as copper itself, offer outstanding heat transfer rates, selection usually depends on the other properties desired — corrosion resistance, hot strength, ductility, etc.

### 3.

**Corrosion Resistance.** Every corrosion problem is different — and there's a copper alloy to meet most: for chemical applications, heat exchangers, processing equipment, refrigeration apparatus, etc.

### 4.

**Strength.** The high-zinc brasses, nickel silvers, beryllium copper, the silicon bronzes and the phosphor bronzes can be processed to provide tensile strengths of the order of 140,000 psi for hard-drawn wire.

# Copper Metals

5.

**Ductility.** The ductility of most copper alloys permits forming them into a wide variety of shapes and sizes, by spinning, stamping, deep-drawing, etc. For example, the coppers, most brasses and nickel silvers are ideal for cold forming.

9.

**Surface Qualities.** The nickel silvers and low-zinc brasses are widely used in ornamental applications because of their ease of plating and finishing as well as their cold-working properties. New fine-grain brasses offer an ideal surface structure for high finish.

6.

**Malleability.** Pure copper and many of its alloys have excellent malleability for forging, cold heading, coining, embossing, extruding, knurling, swaging, etc.

10.

**Casting Facility.** There are eight basic categories of casting alloys, ranging from the hard, but very strong, manganese bronzes to the free-machining leaded bronzes.

7.

**Machinability.** Free-Cutting Brass, tellurium copper, some of the bronzes and the leaded brasses are readily machinable at high speeds and feeds.

The combination of properties that you need for the best product and the optimum manufacturing cost can probably be found among the copper metals. The copper industry will help you find it. The Copper & Brass Research Association, 420 Lexington Avenue, New York 17, New York, will welcome your inquiry.

8.

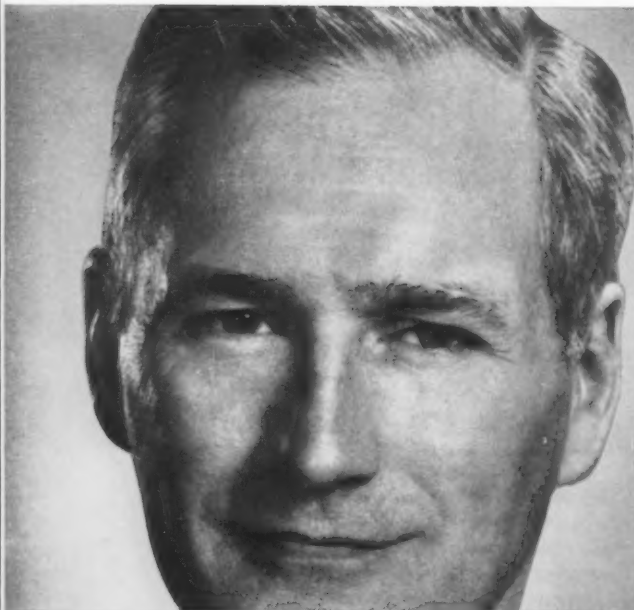
**Joining Qualities.** Copper and most copper alloys can be easily soldered — or, for even stronger joints, brazed with either silver alloys or copper phosphorus alloy. The non-leaded brasses, phosphor bronzes, silicon bronzes and cupro-nickels as well as deoxidized copper also lend themselves readily to welding by a number of processes.

*There's a new frontier in...*

**COPPER  
BRASS  
BRONZE**

**C. J. GANO**, Vice-President & Plant Manager,  
Speco Division, Kelsey-Hayes Co.

## a man who came to Fair Street



**"We heard  
We doubted  
We hoped  
We went to Fair Street  
We bought**

"Two more DeVlieg JIGMILS rapidly followed the first. Continued proof of precision, speed and versatility caused us to buy an additional two machines.

With our JIGMILS we no longer use an expensive machine as a planning desk. We no longer build expensive boring fixtures. The JIGMIL Technique solves these problems and saves both time and scrap.

Our DeVlieg JIGMILS give us the versatility needed in our 'Overgrown Job Shop.' We can make prototypes with the same accuracy as tooled jobs and continue our production without expensive retooling and loss of time."

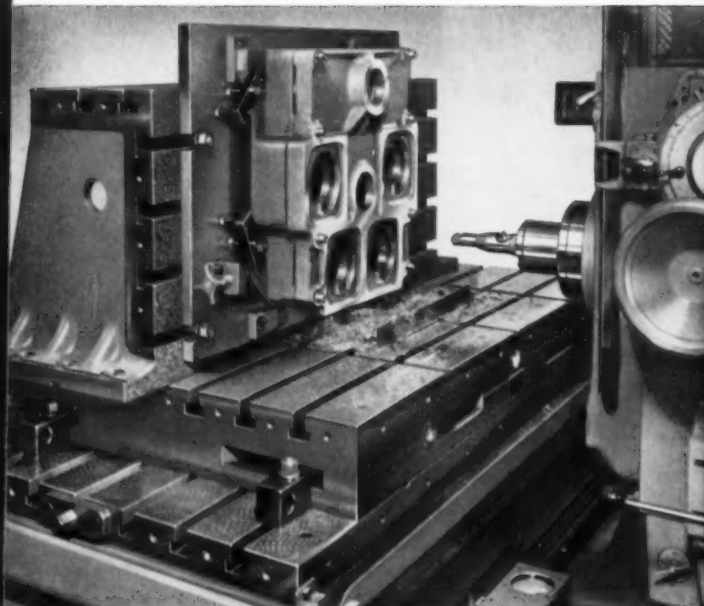
**C. J. GANO**

**DEVLIEG MACHINE COMPANY, FAIR STREET • ROYAL OAK, MICHIGAN**



#### SOME OF OUR JIGMIL USERS

Adams Div., LeTourneau-Westinghouse Co.  
Akron Standard Mold Co.  
Allen Tool Corp.  
American Machine & Foundry Co.  
Andale Company  
Baker-Perkins, Inc.  
Bell Aircraft Corp.  
Bendix Products Div. of Bendix Aviation Corp.  
Bryant Chucking Grinder Co.  
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Heintz Div. Kelsey-Hayes Co.  
Hughes Tool Co.



#### A FEW PROVEN ADVANTAGES OF THE JIGMIL TECHNIQUE

- Eliminates cost of expensive jigs and production delays resulting from their manufacture.
- Simplifies tooling.
- Employs automatic functions to reduce factors of human error even in close tolerance work.
- Makes possible greater flexibility of product design.
- Improves end product by permitting interchangeable assembly of parts without hand fitting.
- Increases production and product accuracy.

#### ACCURACY IS AN ECONOMY!

#### ANOTHER EXAMPLE OF JIGMIL PRECISION applied to guided missile production

Speco Division, Kelsey-Hayes Co., uses the JIGMIL Technique to bore and mill to precise limits of accuracy a wide range of guided missile components such as the one above. Because of their speed, accuracy and versatility, Speco also uses its 5 JIGMILs in the production of such critical items as aircraft and helicopter transmissions, hydraulic control systems, radar antennas, rocket and jet engine precision gears and assemblies.

Improved Paper Machinery Corp.  
McDonnell Aircraft Corp.  
Mechanical Specialties Co.  
Michigan Drill Head Co.  
Oil Well Supply Div. U.S. Steel Corporation  
Paramount Boring & Machine Co.  
Princeton University, Forrestal Research Center  
Rheem Mfg. Co.  
Sandia Corp., Sandia Base, U.S. Atomic Energy Comm.  
Stanley Aviation Corp.  
Teppert Tool & Eng., Inc.  
Van Norman Machine Company  
Wabash Mfg. Co., Inc.  
Wiedemann Machine Co.  
Worthington Corporation

Our newest catalog  
will help you decide.  
May we send it?



WILL YOU BE THE NEXT TO VISIT FAIR STREET

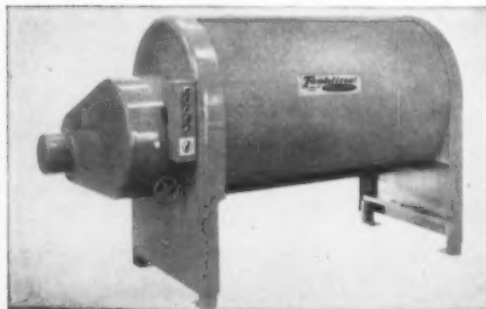
# DeVlieg

## SPIRAMATIC JIGMILS®

ACCURATE HOLES AND FLAT SURFACES  
IN PRECISE LOCATIONS

# NEW

NEW TECHLINE DIVISION IS



TECHLINE BARREL FINISHING EQUIPMENT includes a complete line of single and multiple-compartment machines. Because of their exclusive "modular" design, they are unusually economical, and available in almost endless combinations of size and capacity to meet all production requirements.

from WHEELABRATOR®

# Techline\*

\* TRADE MARK

PRECISION FINISHING EQUIPMENT

for both Barrel Finishing and Wet Blasting Processes

WHEELABRATOR CORPORATION  
*world leader in airless blast cleaning*  
proudly introduces

## Techline\*

\* TRADE MARK

its new precision finishing division, specializing in equipment and supplies for both the barrel and wet blast processes.

## FIRST TO OFFER COMPLETE PRECISION FINISHING SERVICE



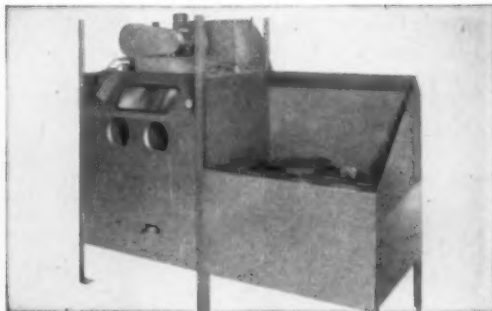
Roy T. Romine,  
Chief Engineer



George H. Lieser,  
Field Sales Manager



Lee D. Stevens,  
Director of Process  
Engineering and con-  
tract finishing services.



TECHLINE WET BLASTING MACHINES add the new "modular" concept of design to the famous Wheelabrator Liquamatte features, achieving new standards of economy and performance for wet blast precision cleaning and finishing. Standard units are available in a wide range of sizes and capacities.

Now, users of precision finishing equipment, for the first time, have a selection of equipment for *both* important processes of close-tolerance mechanical finishing, the barrel and wet blast methods, from one dependable source.

Through its new Techline Division, Wheelabrator Corporation offers a wide line of barrel finishing equipment, media and compounds, as well as the long-established Wheelabrator Liquamatte line of wet blast equipment and Liquabrasives.

Because Techline equipment and

services are not limited to just one process, its application engineers can be purely objective in recommending the one best combination of process and equipment for your precision finishing needs.

Techline design engineers are specialists in precision finishing, with long experience in designing equipment and planning efficient processing operations. Their designs include many exclusive features that are far ahead of any similar machines now available. And Techline offers a complete range of media, compounds and abrasives, all carefully selected

and accurately formulated to consistently produce the finish you specify.

Techline's modern research and testing facilities are at your service. Their application engineers will analyze your finishing problem and process samples of your work, to determine the most effective and economical combination of process, equipment and abrasive for you to use.

This service is available to you without charge or obligation. Write for full information on Techline application engineering services.



*Where precision finishing is a science*

2450 AVENUE V., VICKSBURG, MICHIGAN

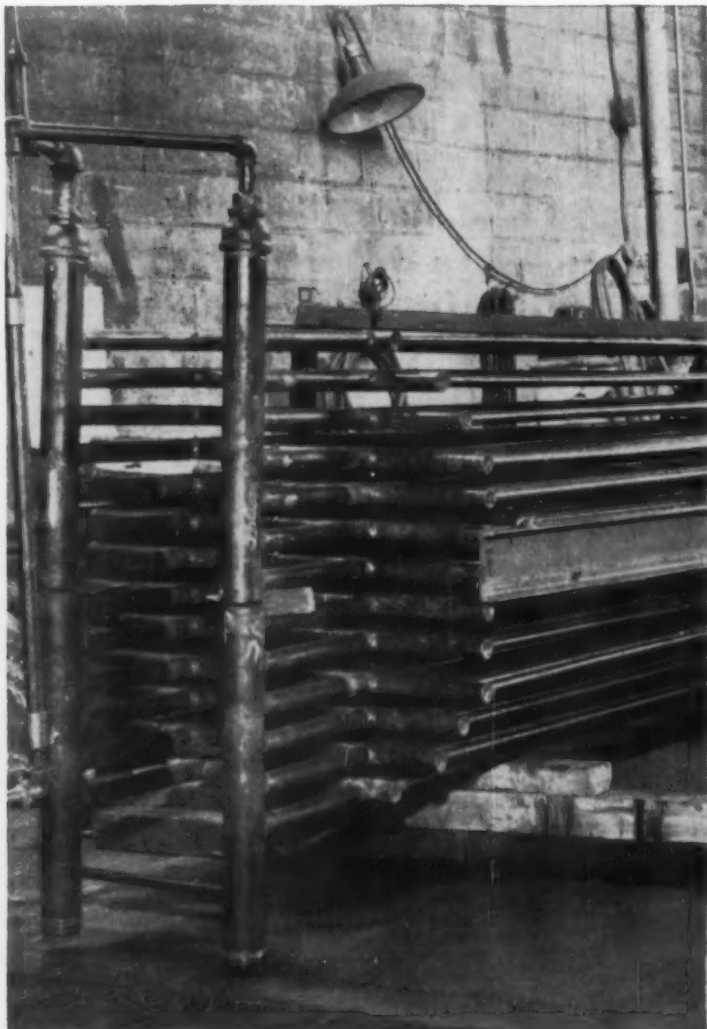
# How they built it better

## with **USS** National



**DRILLING RIG** This drilling rig, an all-purpose, truck-mounted unit called the 1500 HOLEMASTER®, will handle drill pipe and casing loads up to 25,000 lbs. It is rated to drill to 1,500 feet with 2 $\frac{3}{4}$  inch drill pipe. Over 400 feet of National Tube's Shelby Seamless Steel Tubing was used extensively in the 42-foot mast because it offers the ultimate in strength and rigidity in proportion to its size and weight.

*Built by George E. Failing Company, Enid, Okla.*



**HEAT EXCHANGER** The USS NATIONAL Seamless Steel Tubes in this 8-ton heat exchanger, fabricated for Solvay Process Division of Allied Chemical & Dye Corporation, were bent 193 times! What's more, fabrication involved 584 pipe welds of various types and 1,720 inches of fillet welding. The 35-foot-long, 5-foot-high bundle consists mainly of  $\frac{3}{4}$ -inch Schedule 80 NATIONAL Seamless Pressure Tubes. Complete uniformity, ready workability and superior welding characteristics are inherent in every foot of USS NATIONAL SEAMLESS. Pipe fabricators: Cornell & Underhill, Inc., Hoboken, N. J.

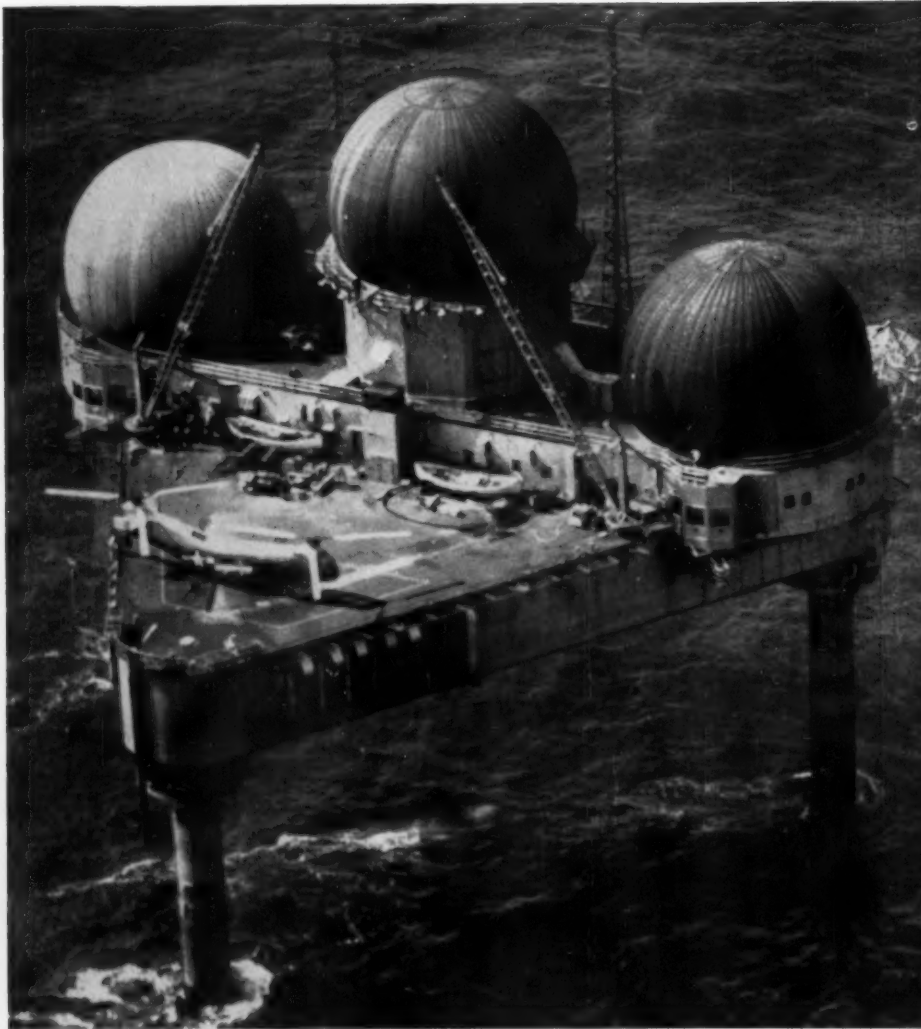
USS NATIONAL SEAMLESS PIPE AND TUBES might be just the materials you need to cut costs, increase strength, shock-absorbency and workability in your product. NATIONAL Seamless is available in a complete range of diameters, wall thicknesses, various shapes and steel analyses. It won't cost you anything to find out. Write to National Tube Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. Or, for Shelby Seamless Tubing, contact your nearest Shelby Distributor.

USS, National, and Shelby are registered trademarks

**"WALLS WITHOUT WELDS,"** a technicolor, sound film on the manufacture of National Seamless Pipe and Tubes is available free of charge to industrial groups, clubs, school groups, etc. Write for information.



# Seamless Pipe and Tubes



**TEXAS TOWER** This man-made radar island stands on giant stilts 110 miles at sea off the North Atlantic coast. An important segment in our country's defense against surprise attack, the \$13,000,000 Texas Tower is the first of five such "plane watcher" stations now under construction. Thousands of feet of NATIONAL Seamless Pipe have been installed in the tower—for steam piping, chilled water piping, fuel oil piping, and compressed air. Tough, strong, uniform NATIONAL Seamless Pipe is specifically designed to withstand high pressures and temperatures—for every length must pass a rigorous hydrostatic test. Every tube has the strength of a solid forging.

*Piping installed by Wallace Process Piping Company, Inc., Norfolk, Va., as subcontractors to Steers-Morrison-Knudsen, Inc., New York City and Continental Copper and Steel Industries, Inc., New York City.*

**National Tube  
Division of**



**United States Steel**

*Look what  
production increases*

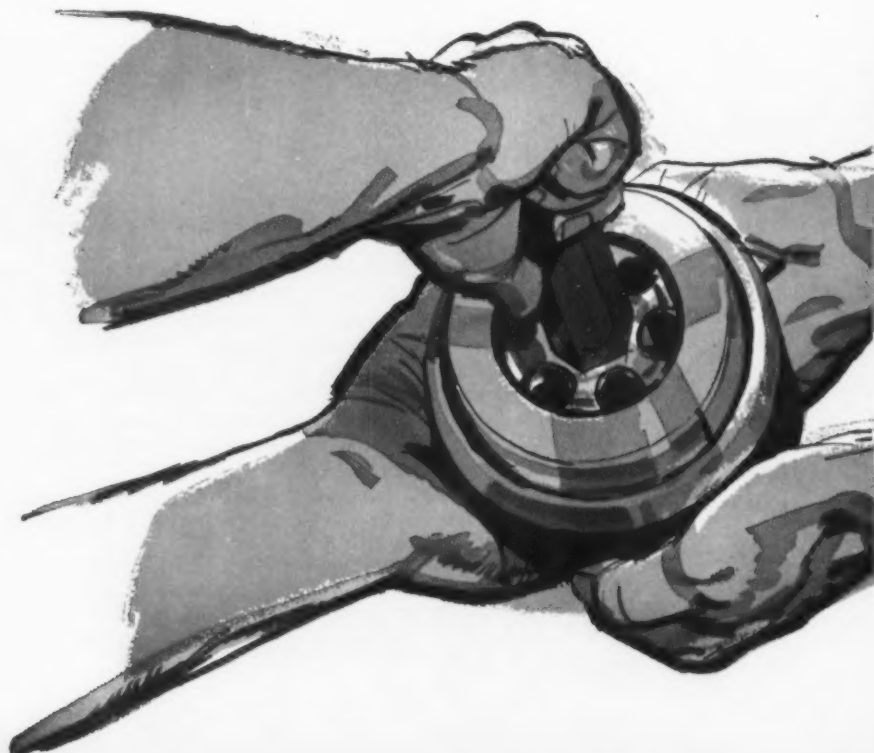
*this company got with*

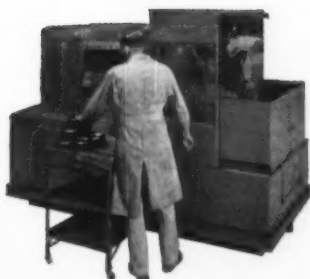


# STANICOOL

## HD Soluble Oil

PRODUCTION MANUFACTURING COMPANY DOUBLED  
NUMBER OF THREADS CUT BETWEEN CUTTER  
SHARPENINGS, SCORED OTHER PRODUCTION GAINS





No trouble. Pressure coupling is checked by O. C. Patterson, vice president of Production Manufacturing, Standard Oil's Roger MacMurray and foreman Byron Finley. Roger MacMurray helped the men in this plant find a new route to production increases with STANICOOL HD Soluble Oil. That's his job, and he's well equipped for it. Eight years' experience in such work, an engineering degree from the University of Colorado and completion of the Standard Oil Sales Engineering School are his qualifications.

**Situation:** O. C. Patterson, vice president of Production Manufacturing Company, Tulsa, wanted to cut down on the number of metalworking products used in the plant. He wanted to use just one oil for cutting SAE 1025 steel, screw stock and SAE 440 stainless steel.

**Action taken:** Checking with Standard Oil lubrication specialist, R. J. MacMurray, Mr. Patterson learned about STANICOOL HD Soluble Oil. A test was set up on a Warner & Swasey automatic bar machine. Roger MacMurray helped set up equipment for the test and helped work out the right STANICOOL HD and water mixtures for the types of metal used. A 4:1 mix for 1025 steel, and up to 10:1 for other metals and jobs was decided upon.

**What happened:** Parts were threaded on the bar machine that Production Manufacturing had previously been unable to thread. On a new Warner & Swasey AC chucker, it was found STANICOOL made possible threading at a speed of 35 surface feet per minute. With STANICOOL HD 150 threads could be cut before the cutter needs to be sharpened. Only 75 threads could be cut before. Plant management found STANICOOL also protected work from rust while it went through many additional shop operations.

**To find out more:** All the facts about STANICOOL HD Soluble Oil are yours. Just call your nearby Standard Oil lubrication specialist in any of the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.**

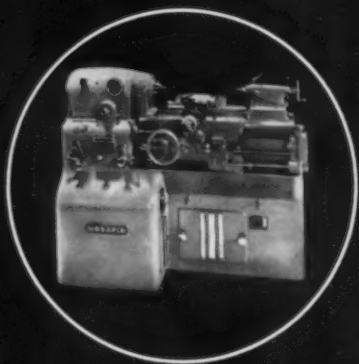
*Quick facts about*  
**STANICOOL HD Soluble Oil**

- Has E. P. and oiliness properties comparable to cutting oil.
- Contains germicide that controls bacteria build-up.
- Is nonirritating to skin.
- Protects machines, tools and work against rust and gumming.
- Will not gel in cold weather, has excellent emulsion stability.

You expect more from



and get it!



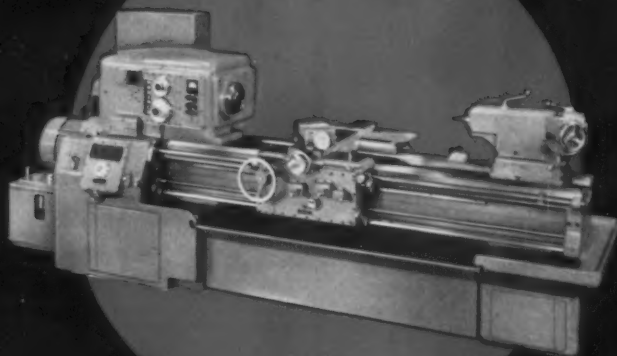
10" Model EE  
Sensitive Precision  
Toolmakers Lathe

**What's your spot? —**

**Monarch Lathes are used  
successfully and widely in**

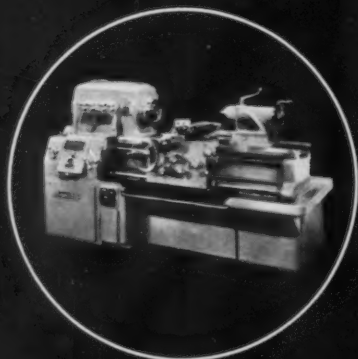
Maintenance Departments  
Toolrooms  
Experimental Shops  
New Development Laboratories  
Small Machine Shops  
*(special equipment for your plant)*

**in addition to direct  
large and small lot  
manufacturing  
operations.**

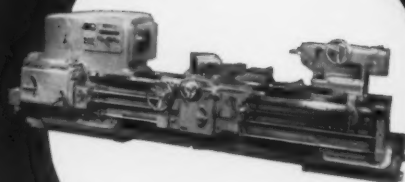


Series 62  
Pre-Selector  
Dyna-Shift Lathe

Series 90  
Heavy Duty  
Dyna-Shift Lathe

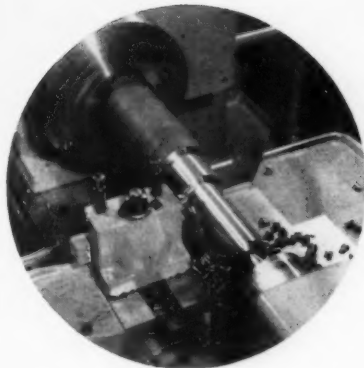


Series 61  
Engine Lathe





# THERE'S A SPOT FOR MONARCH LATHES wherever metal is turned



And "wherever" is in many industries such as these!

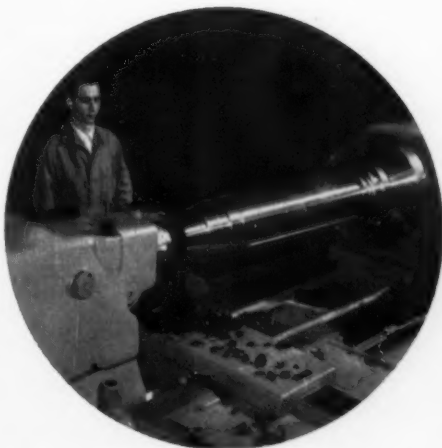
Beverages	Optical
Buttons	Paper
Carpet	Plastics
Cement	Publishing
Chemical & Dye	Rubber
Confectionery	Soap
Drugs	Sugar
Foods	Textiles
Glass	Tile
Lumber	Tobacco
Mining & Refining	Transportation
Motion Picture	Utilities
Oil	

Yes, when it comes to keeping the wheels of the basic process and service industries turning, Monarch lathes play as vital a role as they do in the metal turning industry's tool-rooms and production lines. Here, their job is to keep other machines functioning without failure, at a profit. Or to serve in their improvement.

So the same qualities that make all Monarch lathes first choice in the production turning field make many Monarch models equally important to almost every industry regardless of product. You want economy of operation, high degree of accuracy, utter reliability, bold engineering. You'll find all this in the Monarch models pictured here—and others . . . . . The Monarch Machine Tool Company, Sidney, Ohio.

## For All Users Monarch Lathes Offer These Advantages

1. Built-in versatility for a wide variety of turning, boring, facing and threading operations.
2. A vast selection of supplementary equipment for unusual or difficult work requirements.
3. High speed for the efficient handling of *all* work within the capacity of each machine.
4. Power for heavy cuts *plus* fingertip speed control to assure maximum tool life on all cuts.
5. Long, trouble-free life based on sound design and on manufacturing techniques which have served industry well since 1909.
6. Accuracy of performance which can come only from one of the world's most modern machine tool plants whose only purpose is and always has been to produce the finest in precision lathes.



**Monarch**  
TURNING MACHINES  
FOR A GOOD TURN FASTER . . . TURN TO MONARCH



# The Aluminum Man\*...



\*Twenty-three years an alert and untiring communicator of new progress in metal, Chester Engstrom—salesman for Alcoa distributor Central Steel & Wire Co., Chicago—is typical of the men who serve industry through their knowledge of aluminum.

# He helps the flow of industry

Whether the problem at hand concerns efficient flow of gas in a household refrigerator . . . or piping crude oil across half the nation . . . *The Aluminum Man* is uniquely qualified to help you select proper tube and pipe for your needs.

He knows *where* and *when* aluminum will serve you best—*how* and *why*—because he has been mill-trained by Alcoa experts. Behind him and the recommendations he makes stands 70 years of aluminum progress by the company

that pioneered nearly every commercial application of aluminum tube and pipe!

*The Aluminum Man*—your Alcoa distributor salesman—offers the most extensive selection of tube and pipe in the industry. His advice and service are available to you whether you need a few pounds or a few thousand pounds of Alcoa® Aluminum . . . the light metal with the bright future that's being seen in more places, more and more!



Call *The Aluminum Man*  
He's your Alcoa Distributor Salesman  
... for all Alcoa Mill Products

## ALABAMA

Birmingham  
Hinkle Supply Co., Inc.  
FAirfax 2-4541

The J. M. Tull Metal & Supply Co.,  
Inc. ... FAirfax 3-1612

## ARIZONA

Phoenix

Ducommun Metals & Supply Co.  
BRidge 5-4471

## CALIFORNIA

Berkeley

Ducommun Metals & Supply Co.  
THornwall 1-1820

Los Angeles

Ducommun Metals & Supply Co.  
LUdow 8-0161

Pacific Metals Company, Ltd.  
RAYmond 3-5431

San Diego

Ducommun Metals & Supply Co.  
GRidley 7-3141

San Francisco

Pacific Metals Company, Ltd.  
UNDerhill 3-5600

## COLORADO

Denver

Marsh Steel Corp., KEystone 4-1241  
Metal Goods Corp., DUdley 8-4141

## CONNECTICUT

Millford

Edgcomb Steel of New England, Inc.  
TRinity 4-1631

Windsor

Whitehead Metal Products Co., Inc.  
MURdock 8-4921

## FLORIDA

Jacksonville

The J. M. Tull Metal & Supply Co.,  
Inc. ... EVergreen 7-5561

Miami

The J. M. Tull Metal & Supply Co.,  
Inc. ... 3-6741

Tampa

The J. M. Tull Metal & Supply Co.,  
Inc. ... 3-6741

## GEORGIA

Atlanta

The J. M. Tull Metal & Supply Co.,  
Inc. ... JACkson 5-3871

## IDAHO

Boise

Pacific Metal Co. ... 3-6468

## ILLINOIS

Chicago

Central Steel & Wire Company  
REpublic 7-3000

The Corey Steel Co., Blshop 2-3000  
Steel Sales Corp. ... Blshop 7-7700

## INDIANA

Indianapolis

Steel Sales Co. of Indiana, Inc.  
Liberty 6-1535

## KANSAS

Wichita

Marsh Steel Corp., WHitehall 2-3231  
Metal Goods Corp., AMherst 5-3191

## KENTUCKY

Louisville

Williams & Co., Inc., JUNiper 3-7781

## LOUISIANA

New Orleans

Metal Goods Corp., JACKson 2-7373

## MARYLAND

Baltimore

Whitehead Metal Products Co., Inc.  
EAStern 7-3200

## MASSACHUSETTS

Cambridge

Whitehead Metal Products Co., Inc.  
TRowbridge 6-4690

Roxbury

Eastern Metal Mill Products  
Company ... Highlands 2-5900

## MICHIGAN

Detroit

Central Steel & Wire Company  
TWINbrook 2-3200

Steel Sales Co. of Michigan  
TYler 6-3000

## MINNESOTA

Minneapolis

Steel Sales Co. of Minnesota  
STERling 1-4893

## MISSOURI

Kansas City, North

Marsh Steel Corp. ... GRand 1-3505  
Metal Goods Corp. ... GRand 1-3516

St. Louis

Metal Goods Corp., HARRison 7-1234  
Steel Sales Co. of Missouri, Inc.  
PRespect 1-5255

## NEW HAMPSHIRE

Nashua

Edgcomb Steel of New England, Inc.  
TUxedo 3-7731

## NEW JERSEY

Harrison

Whitehead Metal Products Co., Inc.  
HUMbolt 5-5900

Hillside

Miller Steel Co., Inc., WAverly 6-6000

Kenilworth

Jones & Laughlin Steel Corp.  
MURdock 6-6900

## NEW YORK

Albany

Eastern Metals Warehouse, Inc.  
89-3281

Buffalo

Brace-Mueller-Huntley, Inc.  
VICTORIA 8700

Whitehead Metal Products Co., Inc.  
BEDford 3100

New York

(Brooklyn) Strahs Aluminum  
Company, Inc., BRowning 2-7000

(L. I. City) Adam Metal Supply,  
Inc. ... STilwell 6-7737

Henry B. Lust (circles)  
Circle 6-1748

Manhattan Brass & Copper Co.  
WORTH 6-1200

Whitehead Metal Products Co., Inc.  
WATkins 4-1500

Rochester

Brace-Mueller-Huntley, Inc.  
CONgress 6-6560

Metal Supply, Inc. ... LOcust 2-4260

Sachs Metal Supply Co.  
FAirview 8-1710

Syracuse

Brace-Mueller-Huntley, Inc.  
HOWard 3-3341

Whitehead Metal Products Co., Inc.  
GRAnite 4-4641

## NORTH CAROLINA

Charlotte

Edgcomb Steel Co., FRanklin 5-3361

## OHIO

Cincinnati

Central Steel & Wire Company  
AVon 1-2230

Williams & Co., Inc. ... CApital 1-3000

Cleveland

A. M. Castle & Co., Nottingham  
Steel & Aluminum Division  
ATlantic 1-5100

Williams & Co., Inc. ... UTah 1-5000

## Columbus

Williams & Co., Inc.  
AXminster 4-1623

## Dayton

Ohio Metal & Manufacturing Co.  
Clearwater 3-4192

## Toledo

Williams & Co., Inc.  
GREENwood 5-8661

## OKLAHOMA

Tulsa

Metal Goods Corp. ... GIBson 7-4101

## OREGON

Portland

Pacific Metal Co. ... CApital 7-0693

## PENNSYLVANIA

Philadelphia

Edgcomb Steel Co., GARfield 3-6300  
Metal Supply Co., STEvenson 7-0220

Whitehead Metal Products Co., Inc.  
BAIdwin 9-2323

Pittsburgh

Williams & Co., Inc. ... CEdar 1-8600

York

Edgcomb Steel Co. ... 47-1411

## RHODE ISLAND

Slater'sville

Edgcomb Steel of New England, Inc.  
POplar 7-0900

## TENNESSEE

Memphis

Metal Goods Corp., WHitehall 8-3407

## TEXAS

Dallas

Metal Goods Corp., FLEetwood 1-3271

Houston

Metal Goods Corp. ... FAirfax 3-0141

## UTAH

Salt Lake City

Pacific Metals Company, Ltd.  
DAVis 2-3461

## WASHINGTON

Seattle

Pacific Metal Co. ... MAIn 2-6925

## WISCONSIN

Milwaukee

Central Steel & Wire Company  
HUMBoldt 1-5000

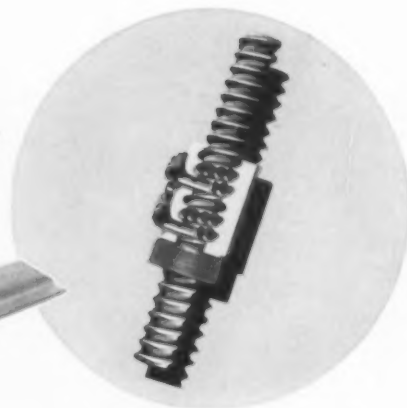
Steel Sales Co. of Wisconsin  
HILLtop 2-2020

Aluminum Products—Hawaii,  
Honolulu 14, HAWAII

**Aluminum Company of America, 958-J Alcoa Building, Pittsburgh 19, Pennsylvania**



This "Screwball"\*  
idea is paying off  
like crazy!



\*T.M. Rég. Hein-Werner Corp.

**A SHORT SUCCESS STORY THAT MAY SUGGEST A NEW WAY TO JACK UP YOUR PRODUCTS' SALES APPEAL:**

**You really jack up Sales Appeal** when you redesign a product to provide far easier and faster operation with over 20% less weight and at 25% lower cost!

That's just what the Saginaw Screw has done for Hein-Werner's "Screwball"\* Jack, compared with hydraulic jacks of equal capacity. Because the nearly frictionless Saginaw Screw converts rotary motion (twirling the crank) into linear motion (lifting the load) with close to 100% efficiency. So maybe you could save a lot of effort, power, weight, space and cost (and get smoother, more dependable performance to boot) in your products . . . just by switching from

inefficient acme screws or costly hydraulics to these extraordinary Saginaw Screws!

We're already building them in sizes from 1½ inches long for delicate electronic controls to 39½ feet long for monster machinery. So if your products (no matter how big or small) use any kind of actuation device, Saginaw Screws may add just the "sizzle" you seek to thrust your sales into higher orbits.

Why not find out right now? Just send us your catalog and our expert engineers will gladly suggest any possible applications without obligation. Saginaw Steering Gear Division of General Motors, Saginaw, Michigan . . . world's largest builders of ball-bearing screws and splines.

Give your products  
NEW SALES APPEAL...  
switch to the

**Saginaw**

WORLD'S MOST EFFICIENT ACTUATION DEVICE

**ball bearing Screw**



## To Stay Ahead: Modernize

Pickup in capital spending may come sooner and be sharper than expected. Expansion plans once shelved are now being re-examined and construction firms are being asked to revise bids. Several large orders for plant equipment await financial approval, which has been promised as soon as management decides the upturn is lasting. More firms are admitting they must modernize to compete on new business.

## Industry to Dominate Fair

Washington, D. C. may get the next world's fair. It would be larger than the current Brussels fair, more on the order of the 1939 New York fair in size. Year: 1963. Site: Bolling Field (Air Force) and Anacostia Air Station (Navy), which are being abandoned. If present plans go through, industrial display will be the dominant factor in the fair.

## Sprayline for Huge Girders

A major structural steel fabricator has achieved automatic spraying of girders. It's reportedly done on a conveyorized production line, handling 32 ton structurals up to 130 ft in length.

## Revive Stockpile Buying?

If all other efforts fail, the Administration is considering reviving stockpile buying of lead and zinc to help depressed producers. This would be used before any higher tariff or quotas, in spite of present heavy government inventories, some officials believe. Backers of aid to these two minerals have little hope that an international agreement to curb imports can be worked out.

## High-Temperature Demands

Need a stable lubricant at high temperatures? Air Force purchasing of engine lubricants is already past the million gallon per year mark and rising. While present lubricants perform at

over 400°F, new materials are coming for 500° to 600°F operation with superior oxidation resistance. Some test materials have even gone as high as 700°F.

## More on Direct Reduction

There's a new entry in the field of direct reduction processes. Having operated a pilot plant, the firm soon expects to announce construction of a production scale unit to turn out 250-300 tons per day for a cast iron pipe plant. The setup will include a sintering machine for partial reduction and an electric furnace for final reduction.

## Check Shale for Gas Source

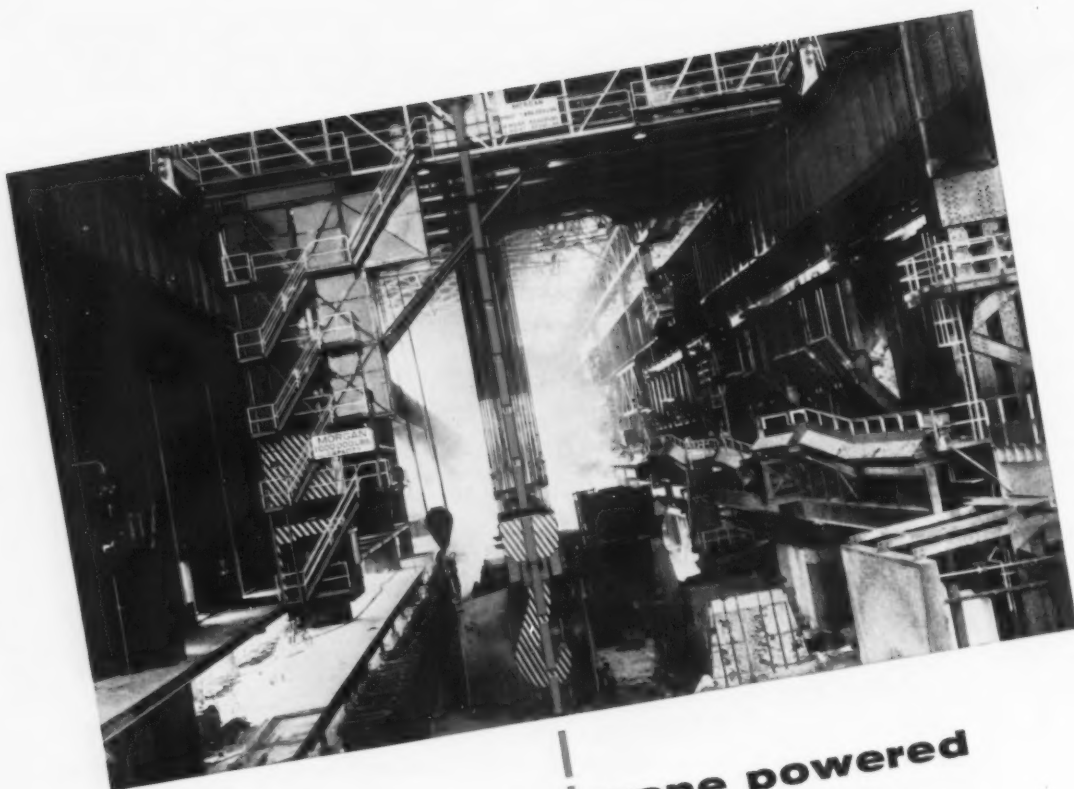
With commercial gas from coal already being studied by utilities, researchers are putting fresh emphasis on gas from oil shale. Shale is treated with hydrogen at 1300°F and pressures exceeding 1200 psi. It's claimed that initial results suggest augmenting natural gas supplies with oil-shale-gas additions into existing pipelines running near oil shale deposits.

## Statistics Aid Steelmaking

Evolutionary operations will probably be tried by at least one steel mill within the next year. The new technique generates its own information. Process settings vary according to a statistical pattern. Changes are not enough to affect quality significantly, but they are enough to point the way to most efficient operation.

## Need New Cutting Tools

Today's cutting tools just aren't suitable for machining the superalloys needed for tomorrow's weapons systems. Air Materiel Command ran a series of tests under optimum setup conditions. Results showed that present tool materials lack needed transverse rupture strength. AMC officials say the need for better basic cutting tools is just as essential as their program to boost cutting speeds to the area of 150,000 sfpm.



## Morgan 500-ton ladle crane powered by Cleveland drives

In an Eastern steel producer's open-hearth department, this giant 500-ton hot metal ladle crane substantially speeds up furnace-to-mold time on their ingot casting flow.

It features two custom-built Cleveland worm and gear sets transmitting 360 horsepower each for driving the hoist gear train on the 500-ton large trolley—providing uniform hoisting speed and power at all times.

Clevalands are designed and built to meet any requirement, wherever a powerful right-angle drive is preferred. Get the latest facts on the "Cleveland Story".

Write us for your free copy of Bulletin 145. The Cleveland Worm & Gear Company, 3282 East 80th Street, Cleveland 4, Ohio.



**CLEVELAND**  
Worm Gear

*Speed Reducers*

*Affiliate: The Farval Corporation,  
Centralized Systems of Lubrication.  
In Canada: Peacock Brothers Limited.*

# How Can U.S. Industries Develop Europe's New Common Market?

**The new ECM will change the industrial map of Europe. U. S. industries will find exporting increasingly tough.**

**But it will provide wide, new opportunities for expanding abroad.—By R. D. Raddant.**

■ The European Common Market is fast becoming a fact of life to U. S. industries dealing in the markets of continental Europe.

And it may already be later than they think for those who want to take advantage of the economic unit to be formed by France, West Germany, Italy, and the Benelux countries—Belgium, The Netherlands and Luxemburg.

**Starts Jan. 1**—First significant effect will be a 10 pct reduction Jan. 1, 1959, of internal tariffs among the six member countries.

In progressive steps, (see table, P. 44) internal tariffs will be cut until, at a time roughly between 1972 and 1974, all tariffs between member countries will be eliminated.

At the same time, common external tariffs will be established, and internal import quotas abolished. When the timetable is completed, the six-nation group will be one economic unit, with free movement within the group of goods, capital, and labor.

**Tariff Will Hurt**—American businesses now dealing in this area view the formation of ECM with mixed feelings. Most are convinced that it will result in greater prosperity for member nations, with a greater export potential for U. S. materials and manufactured products.

But they have to face the fact that eventual abolishing of internal restrictions in the ECM, but with no promise of significant reduction of tariffs to outsiders, will place them at a disadvantage in exporting to that area.

**Time to Plan**—Looking farther ahead, there is the possibility of establishment of Free Trade Areas, with Great Britain, Switzerland, and other countries affiliating with the ECM.

As a result, many companies are

already reevaluating their European trade.

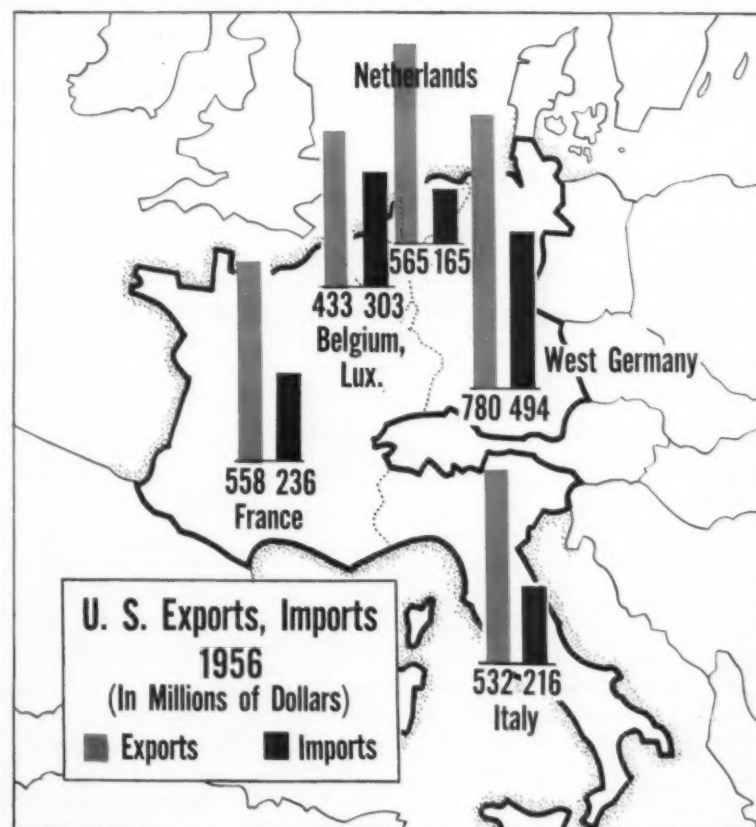
**The Problems**—Two questions immediately arise:

1. What will be the effect of the Common Market in demand for U. S. products?

2. What will be the best method of taking advantage of the new market potential?

Most international trade experts are convinced that removal of trade and economic barriers will have a tremendous effect in developing the economy of the area. But it also

## U. S. Trade Thrives With ECM



will bring important changes.

**Big New Market**—Industry there will have to change its entire philosophy from one of concentrating on a small national area to development of a much larger diversified market.

This will have a major effect on plant location, capital spending, manufacturing methods, as industry recognizes its new market demands.

How big is the market? The area now includes about 165 million population with a gross product of about \$150 billion. By the time ECM is an accomplished fact, it will hit a population of about 175 million with a GNP of \$220 billion.

**Market Potential**—In view of the growth rate of European industry, which has exceeded that of the U. S. in recent years, the market potential is exceptional.

But what about tariffs? One opinion is that development of a larger, more prosperous area with a higher standard of living will create a greater market for U. S. goods. The feeling of those who hold this opinion is that lower external tariffs

will evolve, with a greater movement toward free trade, through GATT (General Agreements on Tariffs and Trade) and other international organizations.

**Freeze Will Grow**—Others agree, but only to a point. They believe that a major market for machinery and production equipment will develop early in ECM's development, but that higher comparative tariffs will sooner or later take their toll of freezing out many U. S. exports.

However, it is generally agreed that development of ECM will add to the market for raw materials, which now constitute the bulk of U. S. exports to the ECM area.

**How to Plan**—Greatest potential of ECM for U. S. industry is establishing, in one form or another, manufacturing operations in the area. It could be in the form of a wholly-owned subsidiary, a form of partnership with a foreign company, or licensing.

Licensing is probably the easiest, but has its disadvantages. At the end of the licensing period, the licensor may have its profit, but is left with no equity in the operation.

Many U. S. companies are al-

ready active in the ECM area, are now actively planning the direction of their future operations.

**Yale and Towne Plans**—A good example is Yale & Towne Manufacturing Co., major manufacturer of materials handling equipment, locks and hardware. The company has a wholly-owned division in West Germany, two divisions in Great Britain (potential Free Trade Area), a large licensee in France, plus other licensees in the area.

Predicts William H. Mathers, vice president and secretary of Y & T:

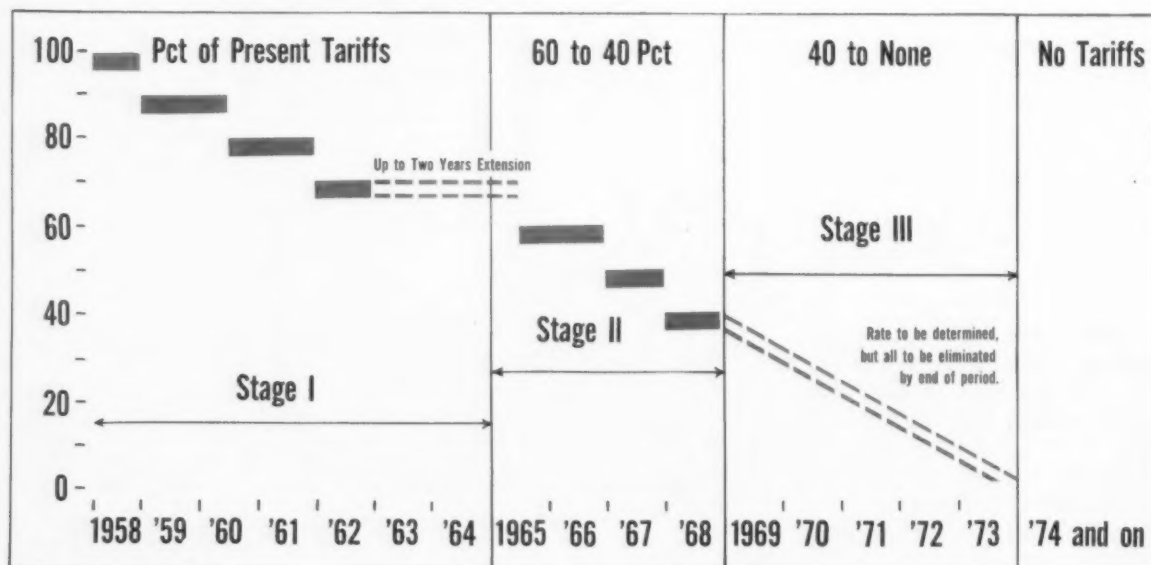
"In its initial stages, a lot of machinery and capital will have to flow into the area. But when internal barriers go down and external barriers go up, it will be more difficult for many American-made products to go to that market.

**Picture Will Change**—"I don't believe that we will be able to ship products as we do now. Eventually, they will be able to make lift trucks, maybe not as we do, but they can make them. There is no reason why they can't mass produce."

He believes that any U. S. company now exporting into the area,

## Common Market Tariff Timetable

Schedule of Reduction of Internal Tariffs





or planning to, "has to get in, and the quicker the better."

He points out that for those who have operations in the area, it's time to start gearing them for the new market.

"We are already doing so in Germany, and Britain too, by improving our divisions, building them up, and making them better."

In both Germany and England, extensive physical expansion of the properties has been undertaken.

**European Meeting**—Early this year the company held a meeting in France of its overseas executives, licensees, and others involved in the operation. The company analyzed the ramifications of ECM and took steps toward establishing definite policies.

While the wholly-owned subsidiary has its advantages, many believe that some arrangement of a partnership nature with a European company has greater advantages.

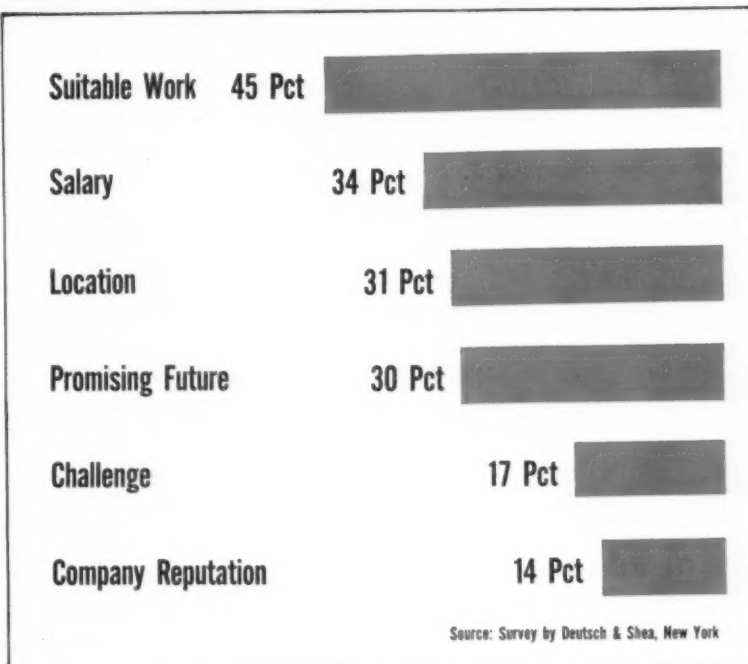
**National Preference**—In the first place, the European company already has a working knowledge of the area and its markets. It probably has a substantial operation and it may be much more economical to add to an existing facility than to start from the bottom up.

Furthermore, there's the delicate problem of political considerations and national prejudices. In the future, it might be a distinct advantage for the operation to be at least partly controlled or operated by a national group from one or more of the ECM countries.

**Inevitable Steps**—To date, the ECM remains a vague timetable, with almost every point subject to negotiation along the line. However, barring the unforeseen, few international experts have doubts of its ultimate completion.

**Reprints** of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

## Why Engineers Like Their Jobs



## Engineers Rate Jobs

■ Engineers would rather stick to their lasts, but are lured to other fields by hopes of greater rewards. That's the gist of a new survey of 1500 engineers by Deutsch & Shea, New York technical manpower consultants.

More than 80 pct of the engineers responding felt that greatest opportunities for advancement lay outside of technical work. Sixty-five pct believed that administrative work offered greater opportunities, while 17 pct felt that sales fields were greener. But only 42 pct would leave engineering work if its pay and opportunities equalled those of administration and sales.

**Westward Ho**—Among married engineers wives' opinions were important, with 82 pct consulting their spouses before taking present jobs. Only 16 pct of married engineers

disregarded their mates' feelings.

Location is a major factor, with many engineers agreeing with Horace Greeley. Mountain and Pacific states ranked highest as areas where engineers want to live. Among cities San Francisco and Denver hold top billing. Over half the respondents in the Middle Atlantic states would prefer to work elsewhere. Other sections of the East, except Florida, showed similar preference patterns.

Geographical distribution of the sample closely paralleled engineer distribution as reported by the 1950 Census. But the survey favored mechanical engineers, who composed 50 pct of the sample, as against only 25 pct of the actual engineering population. Almost 80 pct of the sample was engaged in research, development, and design.

# Big Steel Builds a Pilot Mill

**Bridging the gap between the lab and production is costly, even for biggest firms.**

**Over the years, U. S. Steel has been assembling a complete, pilot-sized mill.**

Recent announcements from United States Steel Corp. point up a startling fact: The Corporation is quietly acquiring a complete set of equipment for steel production on pilot scale.

There are still a few gaps but U. S. Steel now has pilot facilities for sintering, direct reduction and the making of iron and steel. It has pilot lines for rolling steel, for coating sheet with plastic and for electrolytic tinning.

**Risk Is Preferred**—The Corporation has announced plans for coke blending facilities and for an aluminizing line. Not announced yet but

already ordered is a punch card control system for the pilot rolling mill.

Basic thought behind these facilities, says researcher James Austin, is that you can never fully develop or prove out a steelmaking process by bench scale experiment. Administrative vice president, research and technology, Dr. Austin does not expect to take the risk out of research.

"Any research program that results in 100 pct success is much too conservative," he says.

**Reduces the Gap**—But Dr. Austin does see pilot lines reducing the gap between research and production. This gap represents a large gamble when a mill goes into a completely new process. It represents a time loss on process improvements because production equipment must be tied up for experiment or shake-down.

In recent years the gamble has

grown greater and the time loss more costly due to the increased size and cost of steel mill equipment. The cost of a 45 in. slabbing mill increased 136 pct from 1952 to 1957. Cost of an 80 in. hot strip mill jumped 394 pct from 1936 to 1952.

**Inflation Figures In**—Apart from cost, capital expenditures are particularly decisive for steel mills because equipment lasts so long. There are facilities running today that were installed 20 and 50 years ago. If mill management makes a mistake, it has to live with it a long time.

Pilot plants are a natural outgrowth of this situation. The pace of inflation gives a significant cost advantage to the mill that goes first on a new process. Pilot installations reduce the risk of pioneering.

**Pilot Costs High**—The trouble is,

## U. S. Steel's Pilot Plants

Add them all together and pilot facilities at several U. S. Steel Corp. locations come close to forming an entire mill. Purpose of these plants is to bridge the gap between laboratory experiments and production. Completed and coming projects include:

### Raw Materials

**Sintering line, Monroeville, Pa.—15 tons a day.**  
**Coke blending plant, Clairton, Pa.**

### Iron Making

**Direct reduction plant, South Chicago Works**  
**Blast furnace, Bruceton, Pa.**

### Finishing

**Hot reversing mill, Monroeville, Pa.**  
**Card control system, Monroeville**  
**Electrolytic tinning line, Monroeville**  
**Aluminizing line, Monroeville**  
**Plastic sheet line, Irvin Works, Dravosburg, Pa.**



pilot facilities for steel are themselves expensive. U. S. Steel's practice sintering line turns out 15 tons a day. Its reversing hot mill is powered by a 350 hp motor. Its coke blending plant will actually be a full scale production model, built specifically for experiment.

U. S. Steel has the payoff that will support this kind of development equipment. In sintering, for example, experience gained on the pilot line can be applied to tonnage plants at Pittsburgh, Youngstown, Fairless and Chicago.

**Big Operator**—With 45,000 tons of sintering capacity being added, the corporation expects to boost the ironmaking potential of its central operations group by at least 15 pct and possibly as much as 30 pct.

As Dr. Austin puts it, U. S. Steel has no monopoly on pilot plants but "we are probably operating on a broader scope than most others."

**Plants Spread Out**—The full scope of U. S. Steel's model mill has escaped notice because facilities are widely dispersed. The direct reduction plant is in Chicago. The sintering line, the hot reversing mill, the electrolytic line and the aluminizing line are at the Monroeville research center near Pittsburgh. The blast furnace is leased from the Bureau of Mines at Bruceton, Pa.

The coke blending plant will be at Clairton Works near Pittsburgh. The plastic coating line is at Irvin Works in the Pittsburgh district.

**Automatic Controls Next?**—Pilot equipment could very well show up in U. S. Steel's new building for electromechanical equipment at Monroeville. All steel mills are concentrating on automatic controls. Quality control programs have brought them up against a new need for precise sensing and control devices.

All in all, the corporation has about tripled its research effort in the past 10 yrs. It employs 1000 at Monroeville, including about 100 in fundamental research. There are another 300 field metallurgists and more researchers at individual divisions.



**DEMONSTRATOR:** After launching, the Platanode, steel hulled cruiser, will demonstrate new anti-corrosion control designed for small boats.

## Platinum Anode Aids Corrosion Control

■ A tiny platinum anode—using only about  $\frac{1}{8}$  oz. of metal—is featured on a new corrosion control system developed for small, steel-hulled boats.

The anti-corrosion control is a modified and miniaturized version of the Capac system developed by Charles Engelhard, Inc. Its initial installation was made last week on the Platanode—a new steel hull cruiser christened at Harbor Island, N. C.

**Small Power Needs** — The new cruiser will demonstrate the system, which uses electricity to prevent corrosion, to small boaters. The Capac method has already been installed on the aircraft carrier Forrestal, the Independence, the atomic sub Triton, and other Naval and merchant ships.

Electrical requirements for the

small boat Capac are so small that even on an idle boat the battery will operate the system for three months.

**How It Works**—Here's how it operates:

Controlled current flows from the platinum anode through the sea to the hull. Current flow in this direction protects the hull. This current, however, could corrode an anode from which the current enters the sea.

But the platinum anode, because of its corrosion resistance, withstands this rugged service and makes the electrical corrosion control practical.

The small boat Capac equipment includes—in addition to the platinum anode—a reference cell and the necessary electrical equipment enclosed in a stainless steel housing.

# Expansion Coming in Chemicals

## Industry Leaders Say Earlier Estimates Were Too Low

**The capital spending picture has suddenly changed for the chemical industry.**

**Fourth quarter surge may bring 1958 totals close to last year's record. — By K. W. Bennett.**

■ A Securities and Exchange Commission forecast setting fourth quarter capital spending by the chemical industry at only \$346 million has touched off a controversy. The chemical industry, and the metalworkers who supply it, are already arguing with the figure. The consensus: It's too low.

The SEC estimated rate of capital spending by chemical producers

at \$1.4 billion for 1958, as compared with \$1.7 billion in record 1957. At this point, the arguments begin. Said the sales manager of a major engineering firm, "I can't go along with a 17-20 pct drop in capital outlays during 1958. Our clients may be off 20 pct on new business. But as far as work put in place this year, we're doing almost as well dollarwise in 1958 as we did in 1957."

**Others Agree** — A major tank fabricator reports, "We're off maybe 10-15 pct in our shipments to the chemical industry. But we suffered most of our loss in first quarter this year and fourth quarter of last year. Figuring that we usually move up seasonally during fourth

quarter, we'll finish 1958 at about 5 pct off last year."

The vice president of production for a large chemical company commented, "I can't go along with a fourth quarter drop in chemical industry outlays. We'll be spending as much in fourth quarter as we did in third."

**Good Customer**—The chemical industry has, for eight years, spent in excess of \$1 billion annually for new plants and equipment. The peak was 1957, when industry outlays shot to \$1.7 billion, of which an estimated half-billion dollars was committed in fourth quarter. To metalworking it's been an increasingly important market for valves, controls, tanks, pipe and tubing, formed plastics, etc.

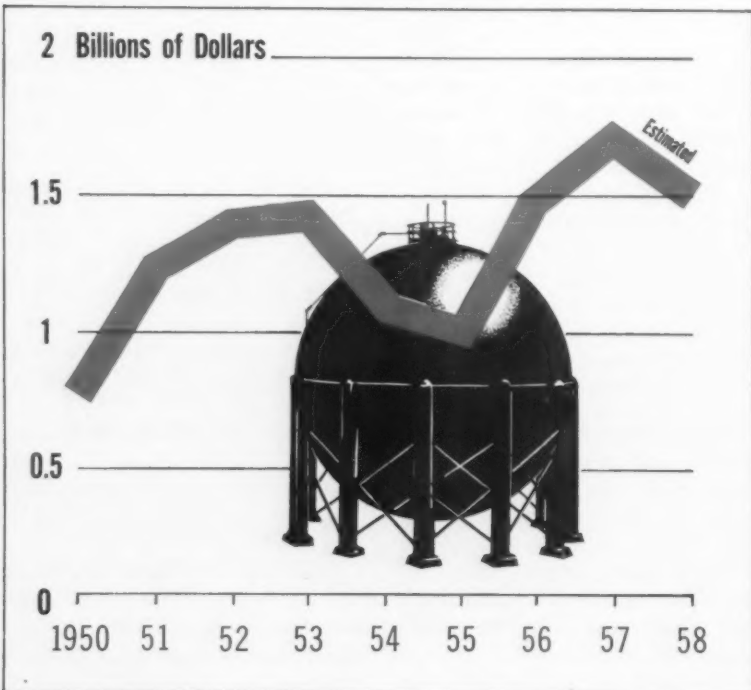
When chemical industries were hit by a drop in sales levels of their products last year, their capital expenditures outlook clouded. A wave of "hold orders" on new plant and equipment, mostly in first quarter 1958 and early second quarter, sent a cold chill through many metalworking sales departments.

**Few Canceled**—But it's well to note these were "hold orders" not order cancellations. It's estimated by industry sources that outright cancellation for new plant and equipment amounted to only about 5 pct of total new plant dollar outlays.

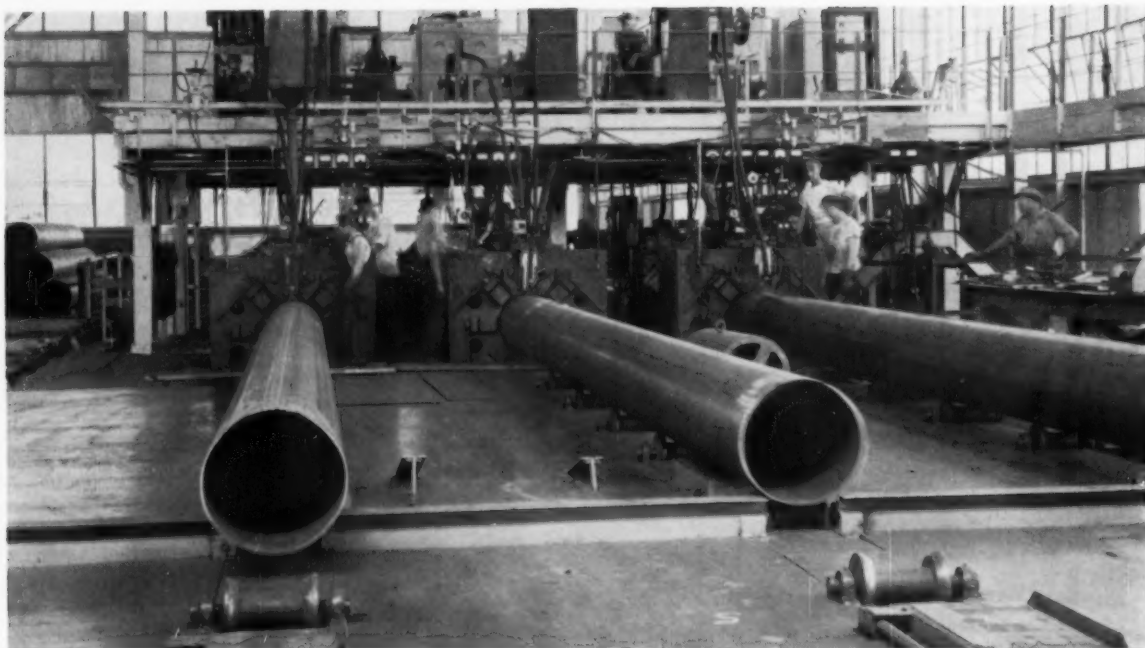
When chemical sales began moving up in May and June, the climate for expansion projects became sunnier. The wave of hold orders declined.

At least three major chemical producers have already figured they'll hit 1957 sales levels in 1958 when the closing figures are in. The entire industry is revising its sales estimates for this year upward, and with them, their expansion plans.

## Capital Spending In Chemical Industry







**TRIPLE BARRELS:** Sections of linepipe emerge from welders at Gadsden plant of Republic Steel Corp.

## Linepipe Sales Will Revive Fast

**Buying of large welded pipe is still a hand-to-mouth proposition. But users may be on quotas again next year.**

**Some are already booking tonnages as hedge against steel strike or price increases next summer.—By T. M. Rohan.**

■ One of the loosest of steel products—large diameter welded linepipe—is showing signs of a major comeback, probably early next year. It was about the last major steel product to become easy to get this year and buying is still hand-to-mouth.

**Looking Ahead**—However, some buyers are already looking ahead to next summer and doing some hedge ordering against price increases and the prospect of a steel strike. Most pipeline promoters don't expect Federal Power Commission ap-

proval and completion of their financing on projects before next year. But they want to reserve space now for delivery in June at the height of their construction season.

Prices are those in effect at time of shipment which accounts for the price hedging for next year.

**Gadsden Bonanza**—Other signs of a tightening market are not far behind.

Republic Steel's Gadsden, Ala., plant is in full production until next February on an order for 450 miles of pipe for which a major release has just come through. This is for Houston Corp.'s 1516 mile line from McAllen, Texas, into Florida.

Other sections of the line are being furnished principally by A. O. Smith Corp., Kaiser Steel, and Youngstown Sheet and Tube Corp.

"If it were not for this Houston release, business would be very spotty," says Jay Owings, Republic

Steel Pipe Div. sales manager. "On the intermediate sizes it is still very slow. And this will continue to the end of the year.

"But if all the jobs pan out which are being planned now, the industry could be booked solid on large diameter pipe well into 1960 again."

**Still on the Books** — National Tube Div., U. S. Steel has felt no significant upturn so far. Releases come through just a little ahead of production. But an improvement is expected about the end of the year and hopes are high for 1959.

Youngstown Sheet and Tube which makes a limited line of welded pipe, up to 22 in. size, is running about half time but expects a major pick-up next year. A busy year is also expected in the West by Kaiser Steel's pipe plant at Napa, Calif., and U. S. Steel's Consolidated Western Div. plant at Provo, Utah.

# Discount Cut Angers Pipe Jobbers

**Mill move slashing jobber discounts on direct shipments of pipe has aroused resentment.**

**Jobbers feel pipe producers are out to get more sales, not correct abuses in the discount system.—By G. J. McManus.**

■ Pipe mills are waiting nervously for the dust to settle around their recent change in jobber discounts.

The change covered carload shipments of standard pipe sent directly to a user but sold through a distributor. Jobber discounts on these sales were reduced from 5 pct to 3 pct a short time back.

**Lost Incentive?**—The reaction has been strong and bitter. Jobbers are saying the new margin gives no incentive to sell steel pipe. They say the mills are out to take over all the direct shipment business. Some threaten to drop steel pipe.

The mills say little in reply. According to one explanation, the discounts were cut because jobbers

were splitting their commissions with customers in order to get business. Also there were said to be cases where jobbers were buying pipe at direct shipment prices and then diverting it into stock.

**Opinions Differ**—These explanations are questioned by some. One pipe man called the price cutting "spotty." A district salesman found little evidence of special deals. But a prominent warehouseman frankly admits there was both price cutting and shipment diversion.

"In some areas all the pipe for stock was being bought on a direct shipment basis," he says. Some change in the pricing structure for pipe was needed, this source says. Several years ago the mills eliminated the 5 pct discount on shipments into jobber stocks. This aroused a storm of protest but worked no immediate hardship; the jobber simply added 5 pct to his selling price.

**Dual Pricing** — However, the change created a situation where

pipe was being sold for two prices—one for shipment out of warehouse stocks and at a lower figure for direct shipments. Partly as a result of this, say warehousemen, there was a swing toward direct shipments.

This movement shows up in both warehouse and mill sales of standard pipe. In the first half of 1955, 15 pct of standard pipe sales were direct shipments on jobber orders; 28 pct were direct shipments on mill orders.

In the first half of this year, jobber direct shipments were 21 pct of standard pipe sales; mill shipments were 32 pct. The overall jobber percentage of the market dropped by 4 pct in this period with all of the reduction in shipments out of stock.

**Jobber Support Needed** — A portion of the shrinkage has probably been a question of market conditions rather than of prices. The jobber portion of oil country sales has dwindled even more rapidly than the standard pipe share.

But it is certainly true the price structure on standard pipe has created problems. In some cases the mills found themselves in the embarrassing position of trying to sell pipe to a customer who could buy for less than a mill distributor.

Whether the new discounts will correct the abuses and still maintain jobber support remains to be seen.

**Standard Pipe Critical**—The oil country operation is a special one; a good part of the supply system is mill owned. Linepipe has been a trouble spot on prices but jobber participation is relatively small. It is on standard pipe that independent jobbers are the backbone of the distribution system.

The mills say they have no desire to take over direct shipment business from these jobbers. In most cases, the producers are not staffed to beat the bushes for business.

## Jobbers Handle Big Pipe Volume

**They Sold These Products in First Half '58...**

**....Through These Outlets**

### Standard Pipe

**68 pct of market**

<b>General Distributors</b>	<b>63.9 pct</b>
Direct shipment	20.8
Out of Stock	43.1

<b>Oil and Gas Distributors</b>	<b>4.1 pct</b>
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### Oil country Seamless

**75 pct of market**

<b>Oil and Gas Distributors</b>	<b>69.6 pct</b>
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<b>Other Distributors</b>	<b>5.4 pct</b>
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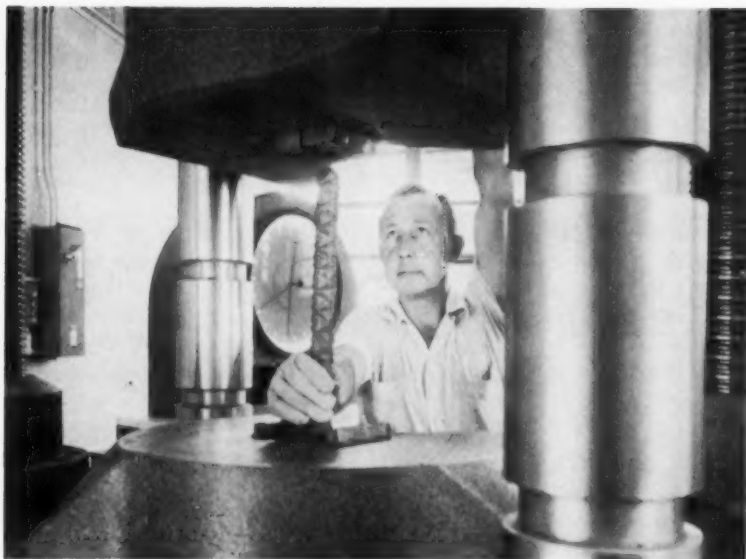
### Linepipe

**18.2 pct of market**

<b>General Distributors</b>	<b>14.2 pct</b>
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Direct shipment	11.9 pct
Out of Stock	2.3 pct

<b>Oil and Gas Distributors</b>	<b>4 pct</b>
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**THE BIG PULL:** This tensile testing machine at U. S. Steel's new metallurgical research lab has a capacity of 400,000 pounds.

## U. S. Steel's New Testing Lab

■ A new metallurgical testing laboratory has been installed by U. S. Steel Corp. at its Duquesne Works.

Plant General Supt. J. W. Price, Jr., said the lab is one of the largest and most complete of its type in the steel industry. It is being used to conduct tests on alloy, stainless, and special carbon steels.

**Special Steels**—Steels produced at Duquesne Works include those used in aircraft and guided missiles, nuclear reactor vessels, electric power generators, ball and roller bearings, television transmission towers, automotive gears and axles, and in other applications.

Prior to completion of the new laboratory, testing to meet customer specifications was conducted in metallurgical department units in widely-separated areas within Duquesne Works.

**Lab Equipment**—Equipment and

testing facilities available to the control laboratory group include the following:

Abrasive cutoff machines, power saws, lathes, hydraulic cylindrical grinders, drill presses, and milling machines in the machine shop area; production-type box furnaces, pit-type convection furnaces, pot tempering furnaces.

**Physical Testing**—In the physical and mechanical testing section, tensile strength testing machines ranging in size up to 400,000 pounds capacity, a bend press, hardness and impact testing machines, and magnetic particle and ultrasonic testing machines also are in use.

Fully - equipped photographic darkrooms have been established to meet the photographic requirements of the metallurgical department and all other departments of the plant.

## Ford's Gas Turbine Is Tested

An experimental 160 hp gas turbine engine has been undergoing exhaustive tests for the past 18 months at the Research and Engineering Center of Ford Motor Co.

A. L. Haynes, director of engineering research and advanced product study, said the program has revealed "tremendous possibilities" for the future of automotive gas turbines.

**Cast Problems Solved**—He explained that the Ford gas turbine, officially designated the "702," actually is made up of components that were tested separately before being ducted together into a complete engine and installed in a tilt-cab truck. Two major obstacles—turbine wheel cost and heat exchanger performance—have been solved, he said.

"A Ford development has reduced the cost of turbine wheels from several thousand dollars to less than 100 dollars," Haynes said. "In addition, we have designed and developed a heat exchanger that should prove of tremendous value in bringing gas turbine fuel consumption into a position competitive with that of other type engines."

**Hill Tests**—"We have taken a 32,000 pound gross load up and down both hills at Dearborn Test Track with ease," he said. "One grade is 17 pct and the other is 30 pct, two pct more than the steepest hill in San Francisco. This performance gives only a slight indication of the engine's capabilities."

Haynes termed the efficiency of the heat exchanger one of the key problems in gas turbine development.

Haynes explained that the exhaust gases, after next traveling through an exhaust pipe, would be discharged into the air at about the same temperature or lower than those released by current gasoline engines.

# U.S. Clamps Down on Spending

## Runaway Federal Deficit Leaves no Other Choice

**Certainty of a \$12 billion deficit this year, and more to come, spells finis for unnecessary Government spending.**

**The most optimistic budget planners hope to check the trend by 1961.—By N. R. Regeimbal.**

■ A bare-bones government buying policy is in prospect as discouraged federal budget planners attempt to ride out the certainty of huge deficits over the next few years.

The 1958 business recession, coupled with a free-spending Congress, has saddled the Administration with a deficit in the current fiscal year that conservatively figured will run to a peace-time high of \$12.2 billion.

**Only the Beginning**—All the inflationary and financing problems such as red-ink government programs will bring are likely to continue for at least another two years, and probably longer, the experts say.

In its latest budget review, the Eisenhower Administration now figures that revenues during fiscal year 1959 (which ends next June 30) will amount to only \$67 billion. This is a startling \$7.4 billion less than was in prospect as recently as last Jan. 1, and \$2 billion less than was actually collected in the last fiscal year.

**Austerity Begins**—At the same time, government spending is now expected to top \$79.2 billion, a whopping \$5.3 billion more than the government money managers figured would be spent some eight months ago.

As a result of the record-breaking deficit, the Eisenhower Administration has already started to tighten up its spending. A cut of 2 pct in the number of people on the government payroll has been ordered—to be accomplished by not refilling jobs rather than by dismissals.

**Spending Freeze**—In addition, some \$1.7 billion in extra spending authority voted by Congress for the

Defense Department has been frozen, at least for the time being. This extra authority would have gone for extra missile submarines, some research and development programs, and some troop increases.

No other spending freezes are planned at this time, according to Budget Director Maurice H. Stans. But he indicates that firm orders have been given to all agencies to hold strictly within their original spending estimates.

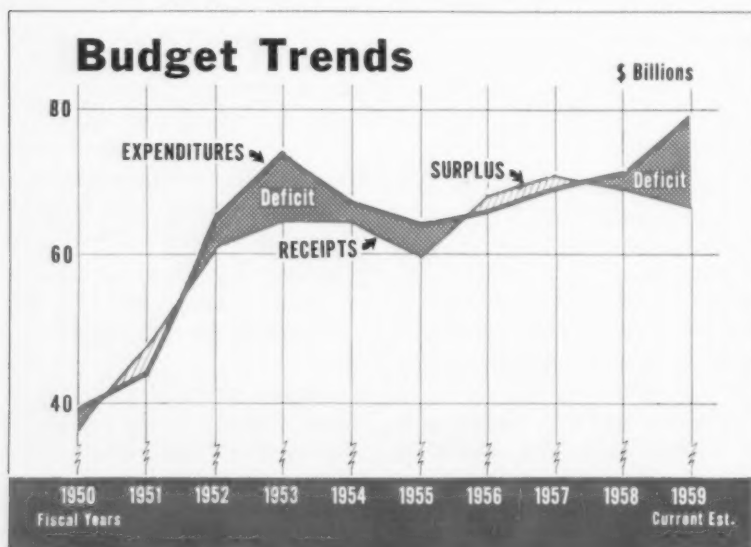
**Balance in 1961?**—The huge deficits foreseen in the 1959 budget are destined to continue, fiscal experts make clear. With spending holding its own, a relative improvement in world tensions to permit a stable defense budget, and rapidly increasing government revenues from a new business boom, it will be 1961 before the budget can again be balanced.

Chances are that it will be a few years beyond that, officials admit.

The drastic jump from an expected surplus this year of \$500 million to the giant \$12 billion-plus deficit is a combination of election-year spending zeal in Congress and sharply reduced revenue forecasts.

**Receipts Are Off**—But the hardest pill for the government budgeteers to swallow is the revenue picture. Receipts from personal income taxes were figured in January to total \$38.5 billion. The current estimated is \$36 billion, down \$2.5 billion from the January estimate. It is still \$1.3 billion higher than the last fiscal year.

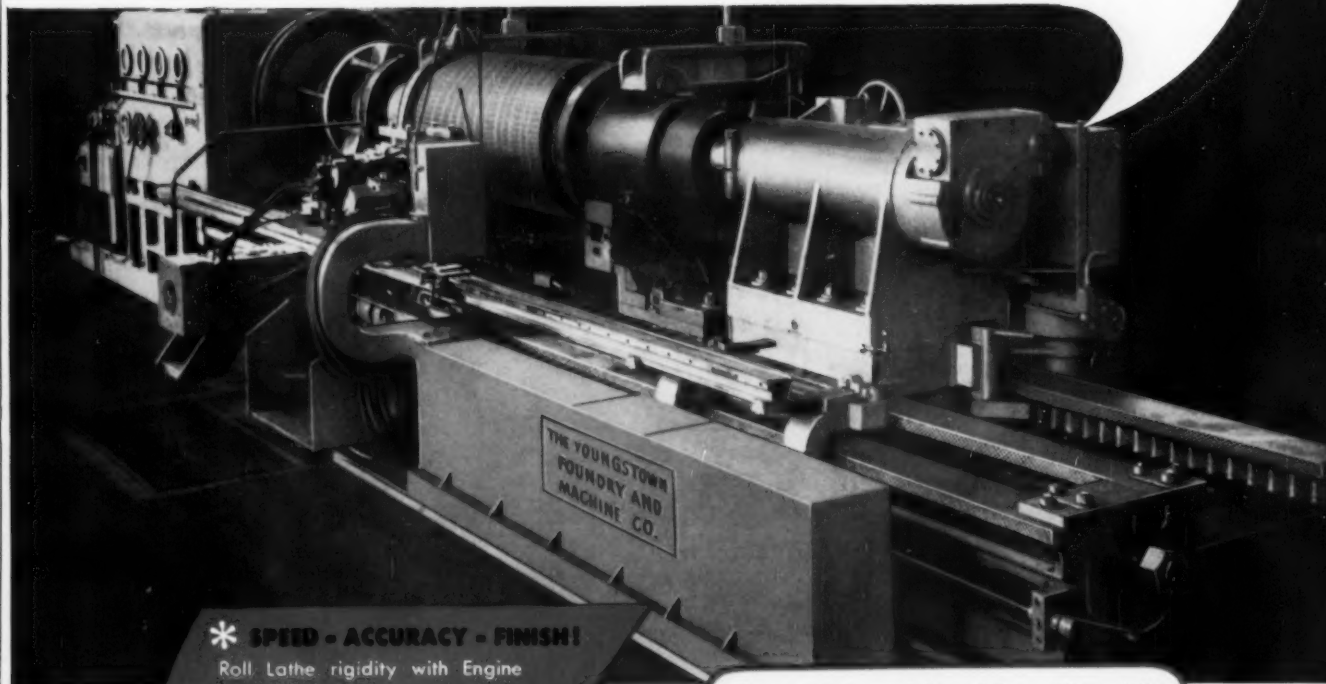
Revenues from corporation taxes paint an even bleaker picture. The recession and higher costs and wages will cut corporate profit taxes to \$16.7 billion. This is down \$3.7 billion from earlier estimates and \$4 billion from last year.



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controlled automatically. Front  
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Far ahead in design and efficiency, this new roll lathe has been developed to turn rolls better and faster . . . either on necks or centers . . . from the smallest bar mill roll to the largest back-up roll. Tested and proved in our own roll shop. Capacities to meet your specific needs.

The 48" roll lathe pictured has a speed range of 1.40 RPM to 81.1 RPM. Roll capacities: 18" minimum diameter, 50" maximum diameter, with 20'0" maximum length. Hydraulic ragging attachment can be furnished, as illustrated. Tell us your requirements . . .

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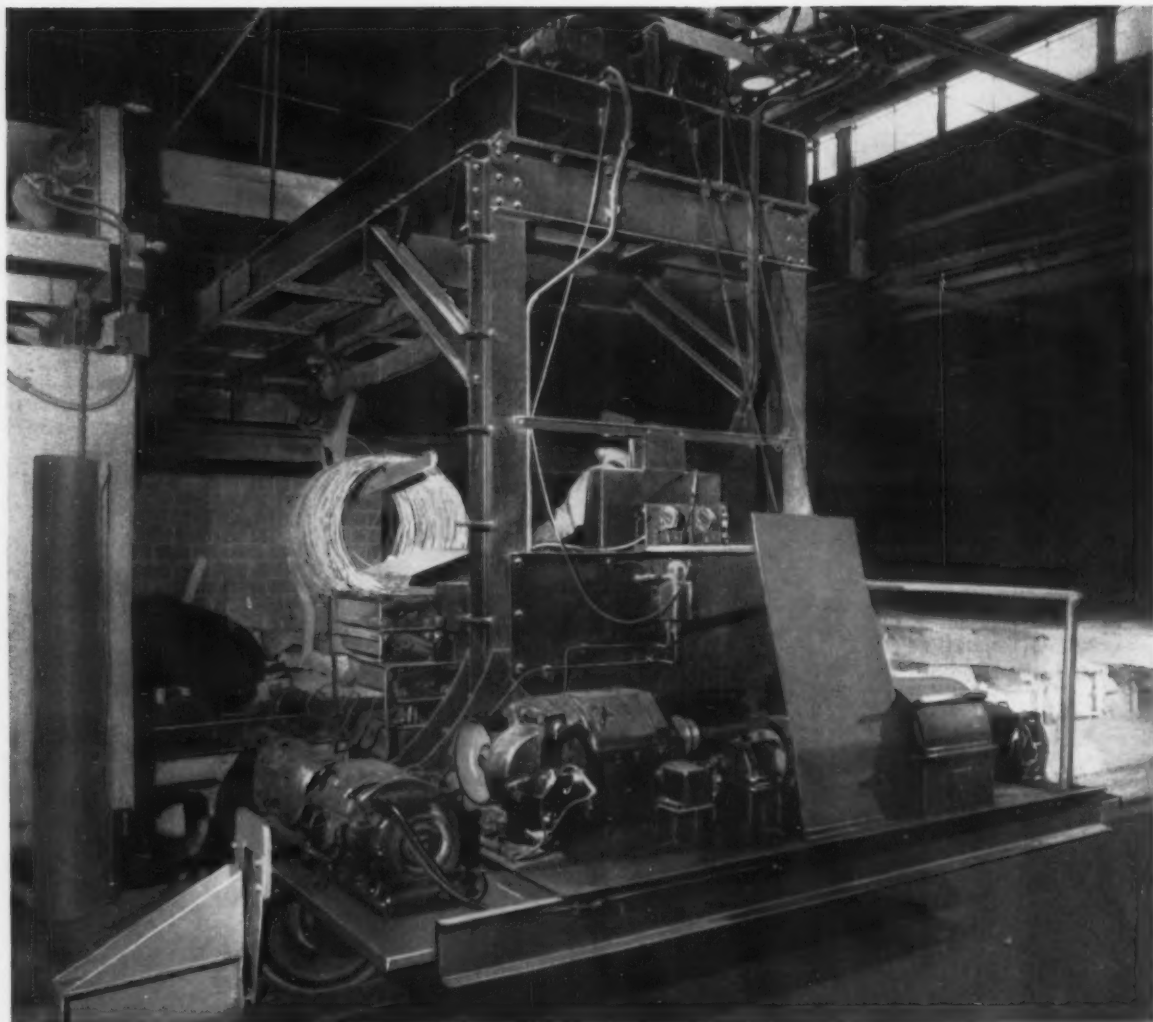
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## Boost production 50% with a crane?

This Whiting Gantry Crane did! Designed for a special need, it fits snug quarters, rides neatly under a low ceiling, has its hoisting drive mounted a step above floor level. Busy gantry gets full credit for increasing Continental Steel Company's rod and wire pickling and coating production by more than 50%. It's one of many types of Whiting Engineered Cranes available to meet the special needs of countless operations.

**SEND FOR "METALWORKING PROFILES,"** the big, colorful new booklet of performance reports showing Whiting products on the job . . . bringing new efficiency and economy to the metalworking industries. Remember: what Whiting has done for others can be done for you! *Whiting Corporation, 15601 Lathrop Avenue, Harvey, Illinois.*



87 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS ARE WHITING CUSTOMERS

# WHITING



MANUFACTURERS OF CRANES; TRAMBEAM HANDLING SYSTEMS; TRACKMOBILES; FOUNDRY, RAILROAD AND CHEMICAL PROCESSING EQUIPMENT



**HOT CARGO:** Dominion Foundry and Steel Co., Hamilton, Ont., uses this specially-built Autocar to haul ten-ton molten ingots from its melt shop to its plate mill, 1½ miles across town. The equipment handles five ten-ton ingots, operates around-the-clock.

## Scrap Industry Declines Refund

Railroads are due to keep the full amounts they have charged since last February to haul pig iron and scrap iron and steel.

An Interstate Commerce Commission action in February allowed the roads to raise charges on these items by 40¢ per ton. Now, after investigating these and other rate increases, ICC decides the boost should be 3 pct, with a 40¢ maximum. This would mean refunds of some \$8.7 million on the seven months of hauling would be owed to shippers.

**Change of Mind**—But the scrap shippers are understood to be content to forego the refunds. The Institute of Scrap Iron and Steel previously had told the ICC it did not intend to invoke the refund provision. Instead, the Institute says the compromise increase now approved by the ICC is acceptable.

Freight rate increases which the ICC allowed to take effect last Feb-

ruary would have given the carriers \$183.5 million in added annual line-haul revenue. The railroads also were permitted to raise accessorial charges, which would have brought in another \$8 million.

In its final decision of these increases, the ICC cuts \$10 million off the tentative \$183.5 million in anticipated line-haul income. Cut-back in the pig iron, scrap iron, and steel rate accounts for part of the reduction, while a reduced livestock rate accounts for the rest.

## Cutting Oil Tax

Machine tool users are advised that oil used in a number of their operations is to be federally taxed at the oil-producer's level.

The Internal Revenue Service has decided the federal excise tax on cutting oils applies to oil used on metals in these operations: Broaching, blanking, drilling, milling, and turning, also die cutting threads.

Application of the excise tax is outlined by the IRS in its new Revenue Ruling 58-440.

## New Structural Mill

U. S. Steel Corp. is building a new blooming and structural mill at its South Chicago Works, C. J. Hunter, general superintendent, announced this week.

The ultramodern mill will make standard structural and wide flange beams of the lighter weights.

The new equipment will include a blooming mill for primary rolling operations, soaking pits, reheating furnaces, a secondary or break-down mill, and a cross country four-stand structural mill. Operation will be controlled by an electronic card-reading and control system.

## Mills Heads M-E-L

Ford Motor Co. announced that B. D. Mills was appointed vice president and general manager of its M-E-L Div. following the resignation of J. J. Nance. Mr. Mills had been assistant general manager of the division since last January.

W. A. Williams was appointed new vice president and assistant general manager.

## U. S. Sells Equipment

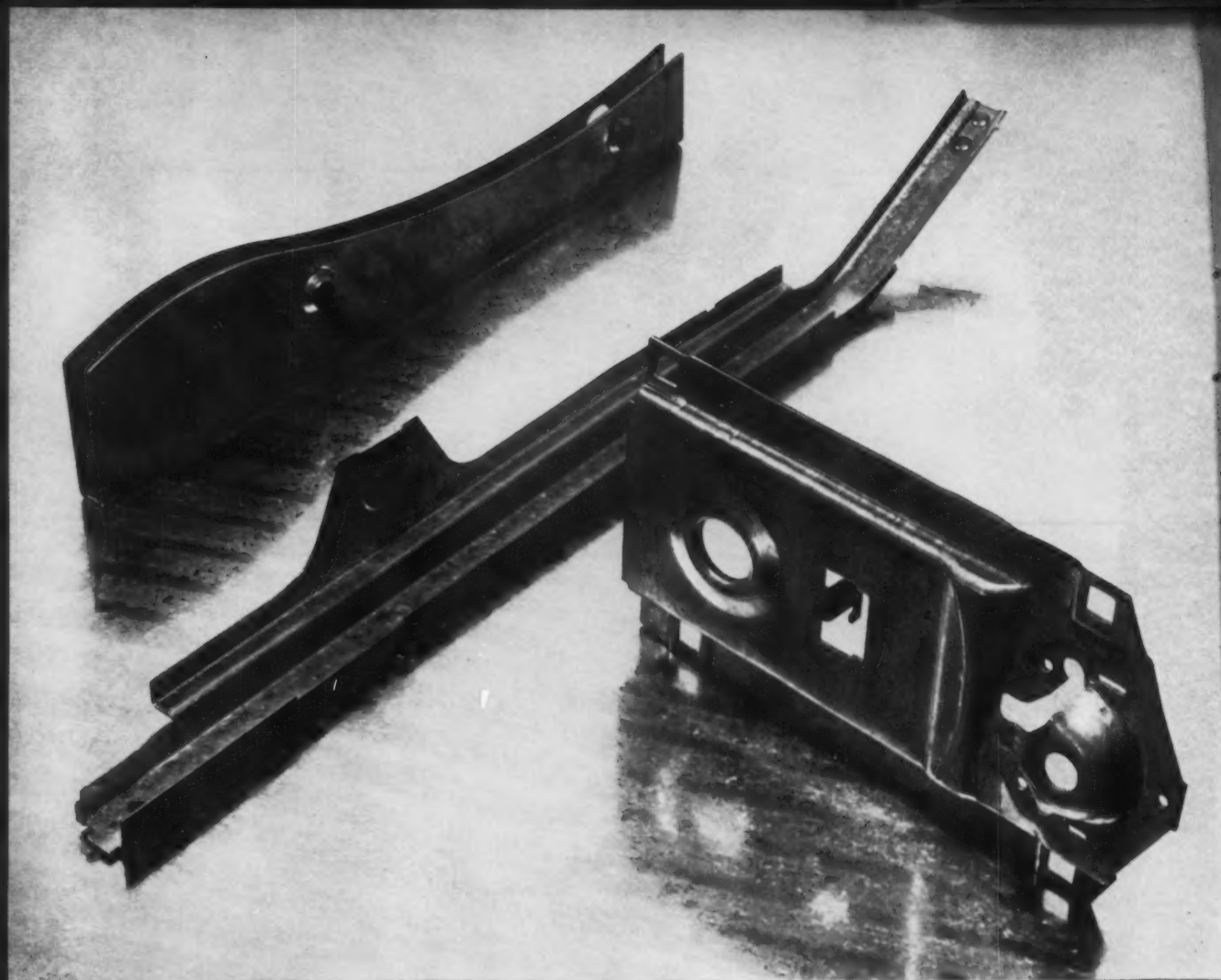
Copperweld Steel Co. and the U. S. Government have agreed that Copperweld will pay the depreciated value of \$718,120 for mill facilities built by the Government at Superior Steel Div. plant, Carnegie, Pa.

J. M. Darbaker, president of the company, explained that the purchase involves an annealing and pickling line, a hot mill coiler, plus related utilities in the strip steel mill. These facilities were built by the U. S. during the Korean war.

## New Glass Plant

Pittsburgh Plate Glass Co. will build a multi-million dollar glass fabricating plant on a 49-acre site at Crestline, O. Site preparation has already started.

The new plant is designed principally for fabrication of tempered glass.



## WHEN WEIRKOTE® GOES ON THE JOB, PLATING OPERATIONS CAN GO OUT THE WINDOW.

**THE PROBLEM:** The close channel walls and variable stages of these steel frame parts defied economical, uniform, flawless plating.

**THE SOLUTION:** The manufacturer switched to Weirkote zinc-coated steel sheets. Result—uniform anti-corrosion protection for his parts, which means that the manufacturer may eliminate post-fabrication plating. Weirkote's continuous-process integrates the zinc and the steel. Even though you work Weirkote to the limit of the steel itself, it just won't flake or peel. It gives first-class protection against corrosion, eliminating inventory losses which might occur in the factory. And it gives first-class protection when out doing its work for your product.

And now, Weirkote is treated to inhibit wet storage (white oxide) stain.

Look into Weirkote zinc-coated steel sheets and the many cost savings and product advantages it can lay on your doorstep. Write for free brochure today. Weirton Steel Company, Dept. A-11, Weirton, West Virginia.



**WEIRTON STEEL  
COMPANY**

WEIRTON, WEST VIRGINIA

a division of

**NATIONAL STEEL CORPORATION**



George Romney

# Auto Industry Man of the Year

**The 'miracle' at AMC might not have happened were it not for George Romney.**

**He fought a dozen major battles inside the company and outside—and won.**

■ Before George Romney's name was lettered on the president's office door at American Motors Corp. four years ago, the company's accounting department was stocking up on red ink. AMC's major asset: A compact car concept which few persons inside the company or out had much faith in.

All this has changed. Today, AMC's compact Rambler is the prima donna of the auto industry. Her sales are climbing steadily while most of the industry is feeling the effects of the recession. The folks at AMC readily admit that it was George Romney who made the difference.

During the first half of 1958 the company netted \$7,329,631—the first profit since AMC was founded in a merger of Nash-Kelvinator and Hudson Motor Co. in 1954.

**Sells An Idea**—Long before he came to AMC Mr. Romney was convinced that a compact car would sell. While managing director of the Automobile Manufacturers Assn. he was impressed by a survey showing that many people bought a car "to go shopping, to go to church, to take short trips." The idea never left his mind.

When he took over the top executive spot at AMC, he soon convinced his own sales department and dealer organization that the compact car was the thing.

**Barriers Overcome**—At the same



**GEORGE ROMNEY:** The compact car is here to stay.

time, he won the confidence of bankers; he won the battle of the stock raiders; he completed a consolidation program; and he cut operating costs to reduce AMC's break-even point to what is probably far below anything else in the industry. It has to sell only 120,000 cars to stay out of the red. This year AMC expects to sell 195,000 Ramblers.

George Romney was born 51 years ago in Chihuahua, Mexico, the son of American Mormon missionaries. His family was driven into California by the bandit Pancho Villa. His childhood was not an easy one, and he grew up with

strong convictions and determination to succeed. Later he attended Latter-Day Saints University, University of Utah, and George Washington University.

**The Road Up**—Out of college, he became tariff specialist for U. S. Senator David I. Walsh in 1929. In the following year he joined the Aluminum Co. of America and represented that company and the Aluminum Wares Assn. in Washington, D. C. From there he went with the AMA and is president of that organization today.

The way Mr. Romney sees it, AMC can't lose, regardless of which way the economy turns.

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All the oxygen your process requires can be supplied economically by LINDE. You can have it in liquid or gaseous form, when and where you want it. You get the exact amounts you need in an un-failing, continuous supply. You invest nothing, and you pay only for the oxygen you use—at a contract price from LINDE.

To serve your pilot plant, LINDE will install the oxygen supply system best suited to your needs. For your laboratories or bench-scale testing, LINDE can supply liquid or gaseous oxygen by the cylinder, or just a flaskful.

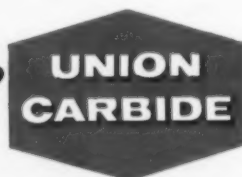
Where large quantities are required, your LINDE oxygen may come from special tank cars or trucks, or directly from an on-site oxygen plant built, operated, and maintained by LINDE. Your supply will be backed up by LINDE's widespread distribution system, assuring you of a continuous flow.

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Whatever your requirements, take advantage of LINDE's more than 50 years of experience in producing and supplying oxygen, nitrogen, and argon to industry. Write or phone your nearest LINDE office today! LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. Offices in other principal cities. In Canada: Linde Company, Division of Union Carbide Canada Limited.

**When you need Oxygen—call LINDE!**

**Linde**  
TRADE-MARK



# Look for Plant Spending Pickup

**Overall outlays for capital spending won't jump sharply, but the freeze on replacement equipment has to ease.**

**Big programs are still a long way off. Survey shows moderate uptrend in overall capital spending.**

■ You can expect some significant improvement soon in new orders for many types of machinery and equipment.

This isn't indicated in the overall outlays for capital goods. These have hit bottom, and may be coming back somewhat, but still won't show significant improvement for some time.

**Freeze Easing**—While the freeze is still on for new plants and expansion, equipment committees in most industries are going to have to take a look at replacement needs. And budgets that could not be cracked this year will have to thaw.

This means that manufacturers will take a closer look at their machine tools, their fleets of lift trucks, and other equipment that must be replaced at intervals, but comes under the heading of capital equipment.

**Won't Economize Too Far** — Even though most companies will continue their policies of strict economy in all expenditures, they are not likely to pursue them to the point of false economy.

Worn out equipment will be replaced and new equipment that can show cost savings will get a full hearing as budgets ease somewhat. Competition will be tough, both on quality and cost, but you can expect a definite improvement in equipment spending.

**Not Overall** — Major improvement in overall capital goods outlays will have to wait until a new surge of expansion takes place, not before late 1959 and probably in the early 60's.

Latest survey of business intent to spend for new plants and equipment indicates that spending will continue through 1958 at close to the current rate, with a moderate rise in the final three months of the year.

Spending for the full year will reach about \$31 billion, compared with \$37 billion in record-breaking 1957. This is the conclusion of the

latest joint quarterly survey by the Securities and Exchange Commission and Dept. of Commerce.

**Durables Down**—Since the peak of capital goods spending in mid-1957, spending by manufacturing companies is down about 30 pct. Significantly, durable goods producers dropped more than non-durables.

Both steel and nonferrous metals indicate further declines through the year. Machinery industries show a rising trend after mid-year. There is little change indicated among the automakers for new plant spending.

## Why Inventory Buildup Lags

**Reverse Situation**—Just as inventory levels continued to climb long after strict purchasing controls went into effect last year—now, they will continue to show declines long after rebuilding has started.

This is something to keep in mind in studying inventory statistics. In a business comeback, new business tends to pare stocks at a faster rate than they can be built up, or put in balance.

**Figures Reflect It**—You can see evidence of this in studying Dept. of Commerce figures for July (latest month available), when inventories continued to drop at a substantial rate. They will probably continue to for some time.

At the same time, sales are up, in manufacturing as well as overall business, and the stock-to-sales ratio dropped to 1.6 months. This is the same ratio as in July, 1957, when both sales and inventories were at a much higher level.

**Sales Up, Stocks Down**—On a seasonally adjusted basis, manufacturing inventories dropped in July from \$50.2 billion to \$49.8 billion. Sales rose from \$25.7 billion to \$26.3 billion.

In the all-important durable goods field, inventories dropped to \$28.3 billion from \$28.5 while sales climbed from \$12.1 billion to \$12.3 billion.

## Independent Salesmen

There's a story running around the East that may have more than a little truth in it.

It's about the sales manager who laments the fact that the recession ended too soon—before he could get a sales crew trained to selling in tough times.

The same fellow says he's afraid he'll have just another bunch of independent salesmen—the kind who won't take orders from anyone.

# Buick Ditches the "Gingerbread"

## New Models Have Clean, Uncluttered Styling

**"It's a complete break with the past," says Buick's general manager.**

**Accent is on simplicity and clean lines. New series names adopted.—By H. R. Neal.**

■ Buick, whose 1958 models earned the distinction of being just about the most chrome-cluttered cars in automotive history, has substituted styling for "gingerbread" in its 1959 models. The crisp, clean lines are so startlingly different, particularly for Buick, the company has even changed the names of the various series.

"We have created a styling that is entirely new in its concept," says Buick general manager Edward T. Ragsdale. "We have broken completely with the past and have created for Buick a light, fleet, jaunty look that is rich in simplicity and classic in design."

**Few '58 Carryovers**—A look at the new models reveals what Mr. Ragsdale is driving at. About the only feature linking the new models with the past is the "meat-tenderizer" grille theme, refined and carried over from the 1958 models.

The 1959 Buicks come in three series, instead of the five previously offered. They are: LeSabre, the lowest priced line; Invicta, the middle; and Electra at the top.

**Low Silhouette**—LeSabre and Invicta are mounted on a 123-in. wheelbase and measure 217.4 in. in length. Electra models, mounted on a 126.3-in. wheelbase, are available in two overall lengths: 220.6-in. for the Electra, and 225.4-in. for the Electra 225. Hardtop models are as low as 54.6-in., but Buick says headroom remains virtually unchanged from 1958 models.

The entire line consists of 17

models: LeSabre has six, Invicta has five, Electra and Electra 225 have three each. All three series have four-door sedans, four-door hardtops and two-door hardtops. There are convertibles in LeSabre, Invicta and Electra 225 series.

**Delta Wing Rear**—There is a two-door sedan in the LeSabre series, four-door estate wagons in both LeSabre and Invicta series and a four-door Riviera Sedan and a four-door hardtop in the Electra 225.

Styling is highlighted by a "delta-wing" theme as rear fenders flare outward, and the same design is carried out in the front end design by canted headlights. Stainless steel trim moldings accent rather than disrupt the clean, sculptured lines of the cars.

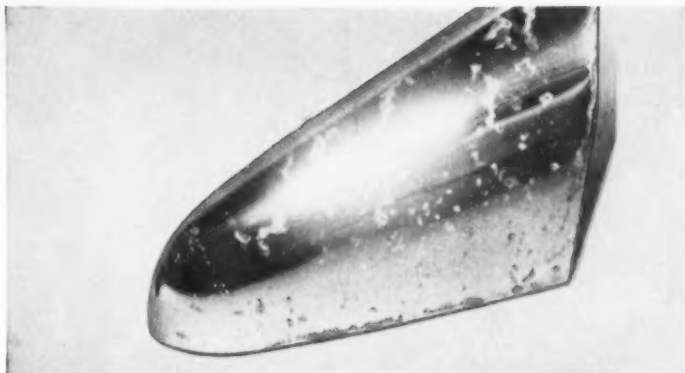
**Glass Happy**—There is greater use of glass. Compound-curve windshields curve into the roof on



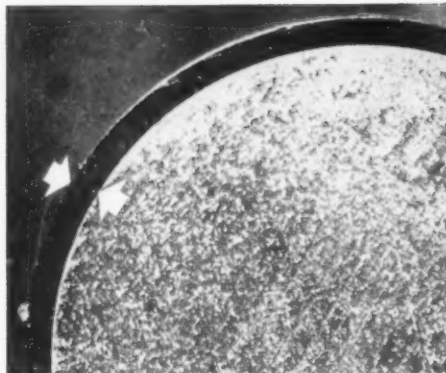
**1959 BUICK:** New trend in 4-door hardtops is Buick's flat roof line. This model, in LeSabre line, has a curved

rear window that wraps around entire rear passenger compartment. Compound windshield cuts wind noise.

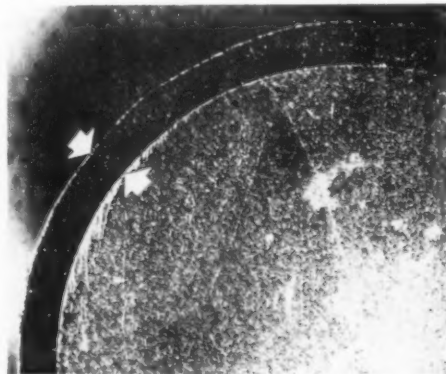
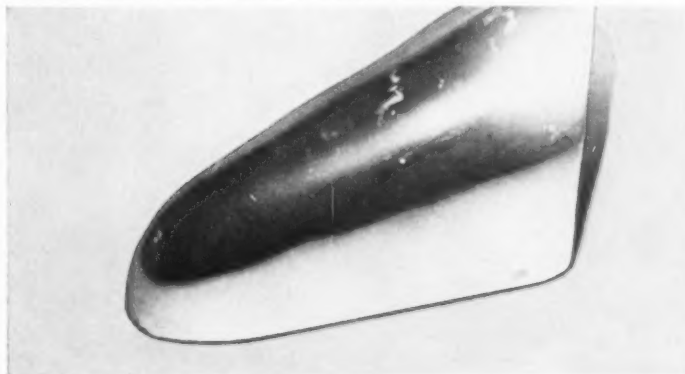




**UNICHROME BRIGHT CRACK-FREE CHROMIUM MADE THIS DIFFERENCE IN PROTECTION.** Photographs show results of 72 hour acetic acid salt spray test. Part at top was plated with ordinary chromium according to automotive manufacturer's specifications for copper, nickel, chromium finishing. Part at bottom had same copper and nickel deposits but Unichrome Crack-Free Chromium replaced the ordinary chromium, thus greatly increasing corrosion resistance.



**UNICHROME SRHS<sup>®</sup> CHROMIUM MADE THIS DIFFERENCE IN THICKNESS.** Enlarged cross sections of identical steel rods show ratio of thickness of plate from ordinary chromium solution (top) to thickness from SRHS Chromium Solution (bottom) . . . a much thicker deposit in the same plating time!



## How to get more corrosion resistance from chromium plate

When consumers find fault with decorative chromium plate, it's generally due to early corrosion.

This trouble starts with pores and cracks that occur in all ordinary chromium in the range of thicknesses generally used for decorative plating. Road chemicals, salt atmosphere and fumes find a path right down to base metal. Corrosion starts. As corrosion increases, finish failure progresses, allowing still more corrosion.

But you can stop this at the source.

### THICKER, CRACK-FREE CHROMIUM

Chromium itself is passive. It doesn't corrode. Eliminate pores and overcome its cracking and you greatly improve its corrosion protection. Pores are eliminated by thicker plating. To overcome cracking, use the Unichrome Bright Crack-Free Chromium Process. This deposit is free from corrosion-admitting cracks. It has already been used in automotive production for a year.

### MINIMIZE YOUR PRODUCTION PROBLEMS

Unichrome Crack-Free Chromium is far superior to ordinary chromium not only in protection, but also in operating advantages. The solution is self-regulating. It offers improved throwing power, also better coverage — even over passive nickel.

### TO PLATE THICKER CHROMIUM

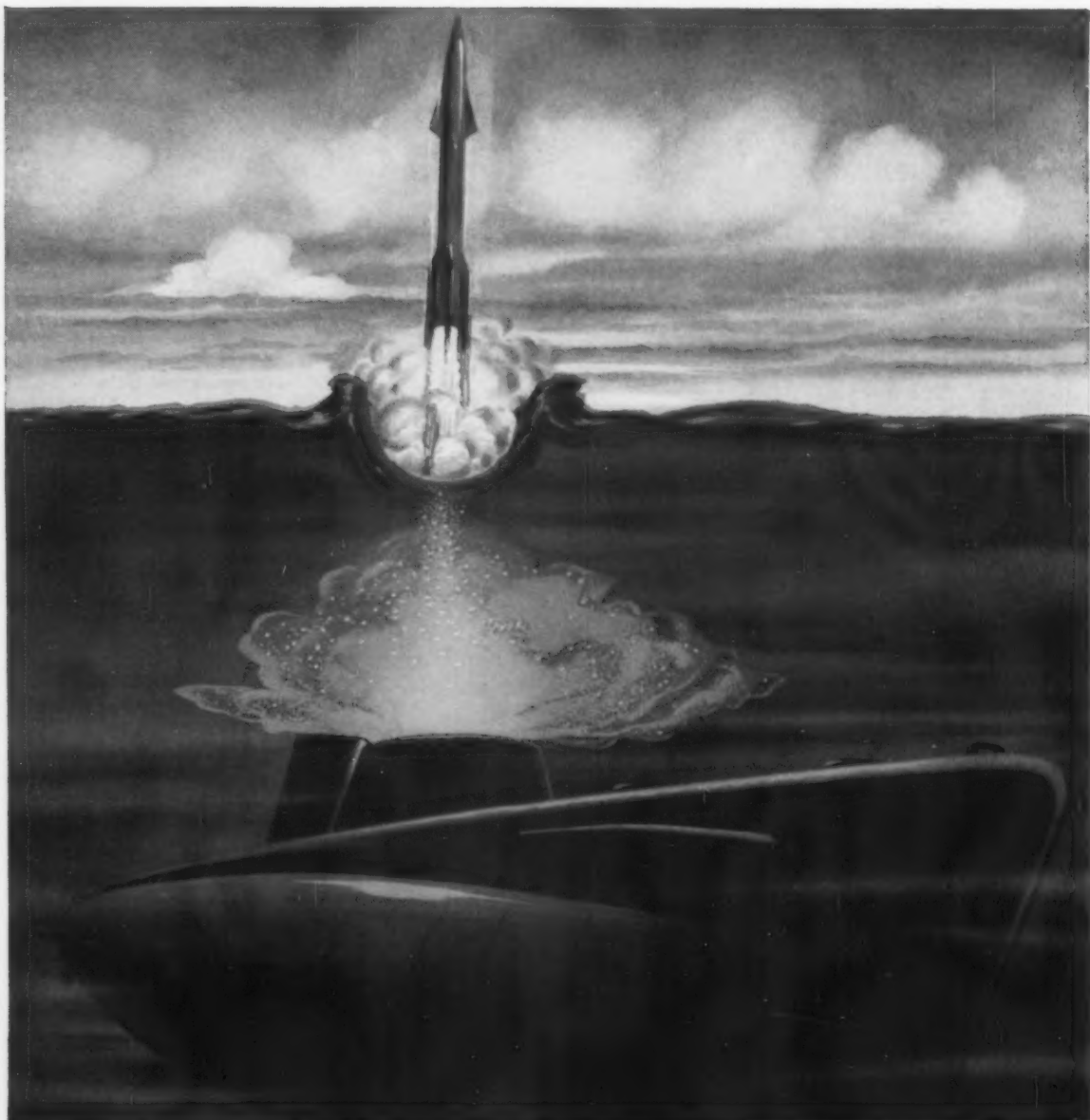
For those who desire thicker deposits but do not require freedom from cracking, other Unichrome self-regulating processes offer distinct advantages. They plate up to 80% faster than ordinary chromium plating processes. They cover parts with less dulling or burning, are less susceptible to clouding due to current interruption. Control is simplified by their self-regulating features.

Whichever process is best for your operations, Metal & Thermit has over 30 years of service experience to help you make it work. Call in an M&T plating engineer to survey your requirements, tell you what's needed for the results you want. Or, send for Bulletins.



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## Underwater weapon . . . with wings!

A major American weapon is shaping up in the U.S. Navy. It's the *Polaris*—a new guided-missile system designed for underwater firing from a nuclear-powered submarine. These mobile, elusive launching sites make defense against *Polaris* practically impossible.

The heart of this deadly weapon is a complex guidance and fire-control system, now under joint development by the Navy and private industry. Without rugged, reliable electrical insulations, such as those CDF supplies, these intricate electronic controls simply wouldn't work.

CDF, a subsidiary of The Budd Company, has pioneered dependable electrical insulations for over sixty years. You'll find CDF products almost everywhere—in the aircraft, automotive, communications, and railway fields, to name a few.

Have you a "problem product"—one that CDF insulation could improve? See Sweet's Product Design File and other directories for the name and phone number of your CDF sales engineer. Send your print or your problem; we'll return pertinent technical literature and recommendations.



**CONTINENTAL-DIAMOND FIBRE**

A SUBSIDIARY OF THE *Budd* COMPANY • NEWARK 85, DEL.

## Automotive Production

WEEK ENDING	CARS	TRUCKS
SEPT. 13, 1958	23,347	6,303
SEPT. 6, 1958	12,016	4,484
SEPT. 14, 1957	85,816	16,777
SEPT. 7, 1957	90,704	17,416
TO DATE 1958	2,778,799	573,978
TO DATE 1957	4,567,454	791,733

\*Preliminary

Source: Ward's Reports

all models and are nearly 45 pct larger than Buick's 1958 windshields. Four-door hardtops feature a rear window that curves around the sides. Two-door hardtops have rear windows which extend up into the roof area. Total glass area is up nearly 40 pct on some models and Buick says there is more than 36 sq. ft of glass area in the new models.

All 1959 Buick exterior colors are acrylic lacquer. There are 13 colors available, but two-tone exterior color combinations are limited to a white roof with any of 12 colors. There are some 49 interior trims available in the various series, each coded to the compatible exterior shade.

**Bigger Engines** — Engines are larger and the compression ratio is up. Electra and Invicta models are equipped with a 401-cu. in. displacement V8 engine and a four-barrel carburetor. The compression ratio is 10.5 to 1.

Displacement of LeSabre engine is 364-cu. in. with a two-barrel carburetor; however, a power package is also available. Use of lightweight alloy parts has reduced engine weight as much as 44 lbs. Oil capacity has been reduced from five to four quarts.

**Air Suspension Limited** — Buick's redesigned twin turbine Dynaflow transmission is standard on all but LeSabre series. Triple turbine Dynaflow is optional on all series. A positive traction differential, optional on all series, delivers power to the rear wheel having the greatest traction.

Air suspension will again be offered in 1959, but the full four-wheel air suspension introduced

last year has been dropped in favor of a system using air springs in the rear only and steel coil springs for front suspension. The new system is expected to be lower priced and more trouble-free than the full system, while still providing leveling action for the rear where it is most needed and their variable spring rate.

## Rambler Outlook Is Optimistic

Last week at Brown's Lake, Wisc., American Motors president George Romney took off on his favorite topic—the "compact" car, and specifically his successful Rambler. (See IRON AGE Salutes, p. 57.)

Compact and smaller cars will continue to make gains in the 1959 automobile market and could take 15 pct of total sales, he predicted. In addition, the AMC executive expects sales of the company's compact Rambler to "increase substantially more than the industry as a whole." The industry, he believes, will be "generally up."

Why? The reason is the American consumer.

**Respect for Consumer** — Mr. Romney described today's consumer as no longer "a faceless, nameless creature motivated by basic desires and needs at a mere subsistence level but both the beneficiary and boss of our economy."

Then Mr. Romney scored industry leaders for the concept of planned obsolescence.

"Forced obsolescence is an important factor in product improvement if that obsolescence is due to real improvement in the product," he said. "However, there is rising doubt that change for change's sake alone has true economic value. More and more motorists at least are feeling that they can do without this expensive ego satisfaction."

To test this theory, AMC's Rambler has only under-gone moderate changes for 1959, including a refinement of rear fins that does much to take away the "awkward look." And to strengthen the product line, AMC will reintroduce the station wagon to its 100-in. wheelbase Rambler American line.

## THE BULL OF THE WOODS



THE COVER UP © 1958 by NEA Service, Inc. T.M. Reg. U.S. Pat. Off.

# More Labor Racket Probes Due

## Senate Check May Extend Through Middle of '59

**Congressional investigation into labor-management racketeering is far from dead.**

**Despite pressure, McClellan plans to continue probe.**

**Some labor reform bills may pass next year when elections are over.—By G. H. Baker.**

■ More labor racketeering scandals are coming. The Senate investigation into labor-management irregularities now looks set to extend at least through the first half of 1959—and maybe longer.

Senator McClellan, D., Ark., the investigating chairman, and Robert Kennedy, committee counsel, say they have enough tips and leads (mostly supplied by rank-and-file union members) to keep the committee busy for "two or three years".

**Halt Urged**—But the probe won't be allowed to go on that long. From the beginning, Senate leaders have been under steady pressure to call off the investigation. Senator McNamara, D., Mich., a member of the investigating committee, hotly resigned his position on the labor-

management subcommittee, claiming the investigations had outlived their usefulness.

Other senators have publicly demanded an end to the investigation, which has been highly embarrassing to union leaders. And the National Catholic Welfare Conference's Social Action Department has issued a statement declaring that interminable inquiry by the McClellan group would serve no legislative purpose.

**Action in '59?** — McClellan, bristling at these demands to call off the inquiry, retorted that "every hoodlum, gangster, and racketeer" would applaud this suggestion.

Next year may be the year for some meaningful labor reform. Elections will be out of the way until 1960 and Congress will have an opportunity to debate labor reform in a much calmer atmosphere than prevailed this year. The record of wrongdoing being exposed by the McClellan group probably will provide much of the necessary background for writing a corrective labor law.

## Why Federal Tax Rise Is Possible

**The Background**—You can expect the Administration to ask for higher federal taxes and new, steeper "user charges" after the first of the year.

Here's why:

There's been a lot of soul-searching among the money experts at the White House over the government's budget problems. No matter how good you think business will get between now and next July, with larger tax revenues from incorporated business and individuals (the two chief sources of government income), the grim fact is that the government expects to spend around \$12 billion more than it takes in.

After much beating around the bushes, the money men finally had to decide their course. Faced with this staggering deficit, should they cut spending or ask for more money?

**Spending Go-Ahead**—They have

now reached their conclusion: More money. A reduced rate of spending, according to the White House, is "unthinkable."

"Unthinkable" is a strong word. Here's how their argument runs: More than 77 pct of the federal budget in these years is for past, present, or future wars, plus interest on the federal debt. And none of this can be cut, according to the planners. In other words, \$80-billion-plus national budgets are here to stay.

**Where They'll Get It**—So the answer is higher taxes. What kind? They're not ready to say yet. But it's a foregone conclusion they'll step up demands for: More "user charges," such as increased rates on aircraft using government airports. Stiffer fees for the services of such government agencies as the Securities and Exchange Commission. Possibly still another bid for increasing postal rates.

## Veto on Economic Aid

Federal financial aid for areas with chronic high unemployment is dead now, though another try for it may be made in Congress next year.

President Eisenhower has vetoed a bill which would have provided \$279.5 million for areas suffering economic distress. Even had he favored the proposed program, Congress failed to vote the money to carry it out.

The bill would have offered federal money for industrial development loans.





## 22 Tons of Cast Steel Against The Sea

ERIE FORGE & STEEL cast steel ship's stern frames meet and beat the stern challenges of the seven seas . . . steel castings bred and born to survive Neptune's furious tempers against maritime and naval shipping. Like the men who for centuries have mastered the sea, these cast steel components boast the rugged strength, the inborn quality to win the coveted "well done" on every voyage.

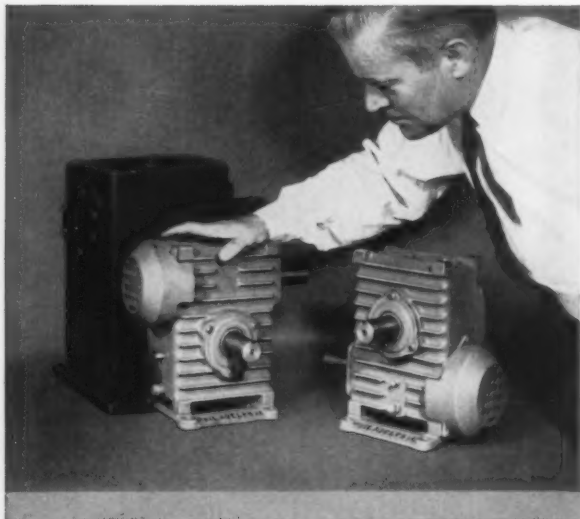
Casting and forging dependable ship's components and vital parts for industrial machines is a long-time habit at Erie Forge & Steel. A habit combining strict quality control from raw materials to finished casting, long experience in producing steel castings to exacting specifications, modern metallurgical, engineering and production methods . . . Procedures that assure the results you expect. Consult with us.

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# new high capacity fan cooled reducers take up 50% less space



## LOOK AT THE SPACE YOU SAVE!

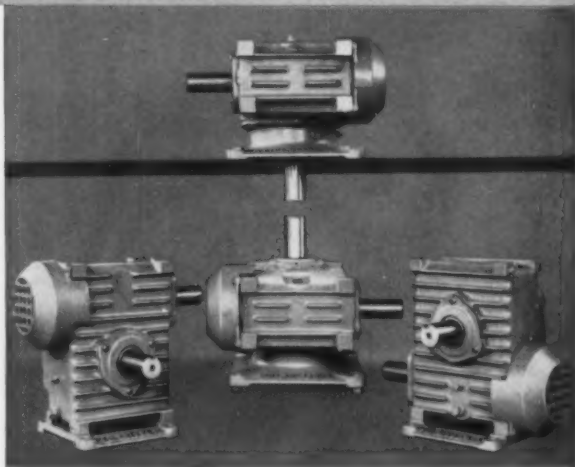
Think what this can mean to your products! You can make important savings in space and weight . . . in the neighborhood of 50% . . . depending upon output torque requirements. Or, you can design for heavier loads . . . up to 80% . . . without adding an ounce of weight to your product. You get more horsepower per dollar!

This new line of Philadelphia Fan cooled Worm Gear Reducers is available in 3, 3½ and 4" center distances for ratios from 5 1/6:1 to 60:1. Fan cooling, sturdy finned housings, improved tooth forms, precision ground alloy steel worms and special high strength bronze gears all combine to give you a drive that will handle heavier loads in less space.

## STANDARD STOCK PARTS SIMPLIFY SELECTION.

These new fan cooled units have a degree of simplicity and flexibility never before available. Standardized housings, fans, gearing and mounting bases permit you to select any drive arrangement you need . . . permit us to give you prompt delivery from stock.

They simplify your design problems too. For Example: horizontal units can be furnished without mounting bases. Housings can be designed as an integral part of your product.



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INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS

# Workers Urged to Aid Politics

## Company Tries Campaign Fund Drive Among Employees

**Back up your ballots with dollars, Aerojet-General Corp. urges employees.**

**Politics needs more aid from average citizens, less from special interests, Aerojet says. — By R. R. Kay.**

■ Should bosses urge workers to donate to political campaign funds? That's a ticklish question. Most companies wouldn't touch it with a ten-foot pole.

But Aerojet-General Corp., Azusa, Calif., thinks differently. The company just started a voluntary political fund-raising drive among its 15,000 employees.

**Backing Ballots**—The aim: Encouraging employees to give money to the candidates or party of their choice. And in this way to promote better government.

Dan Kimball, President of Aerojet-General, maker of rocket engines for guided missiles, feels deeply about this subject.

A former Secretary of the Navy, Mr. Kimball points out that today's political campaigns eat up huge sums of money. If more average citizens backed their ballots with dollars, he thinks more high-calibre men would run for public office.

**Steady Campaign** — "Somebody has to pick up the tab for the ads, TV, radio, billboards, and the direct mailing costs of a campaign," Mr. Kimball says. "It has been my observation that too often the money comes from special interests — people who want something in return."

The company's fund-raising will go on outside of working hours — before or after work, during lunch,

or in the coffee break. Register-to-vote will get a big play.

**Operating Plan**—Here's how it works: (1) Management sets up a Republican and a Democratic committee headed by top men. The committees include engineers, members of the International Association of Machinists (IAM), clerical personnel, and representatives of all other employee groups.

(2) Each committee appoints solicitors. There are about 500 for both the company's plants in Azusa and Sacramento.

(3) Each solicitor has a set of

cards with employees' names.

(4) Expenses incurred by the committees (printing, etc.) come out of the total funds.

**Official Approval**—Can a plant doing government work conduct a voluntary election fund drive? Well, the Department of Defense says "OK."

Incidentally, the California candidates running for the U. S. Senate and for Governor think it's a fine idea. And they're invited to address Aerojet employees after working hours.

## Honeycomb Repair Training Sessions



**BUSY AS BEES:** This is a training course sponsored by Boeing Airplane Co. for the Air Force. Boeing instructors are showing Air Force personnel how to handle honeycomb repair and control surface rebalance.

# Here's a **MARVEL** HIGH-SPEED-EDGE

## Hack Saw Blade we wouldn't sell you!



This blade **could** have been packaged and shipped as a genuine MARVEL High-Speed-Edge Blade . . . and it **might** have performed to a customer's satisfaction. Instead, it was rejected and will be scrapped because inspection revealed a minute imperfection.

There's nothing unusual about this. Certainly, other hack saw blade manufacturers inspect their products, and undoubtedly reject blades for one reason or other, because they are trying to market the best blades they know how to make.

And that's the point—here at MARVEL, where the composite blade was invented and perfected over 30 years ago, we believe we know more about making high-speed-edge hack saw blades than any other maker. We've been at it longer, and the unequalled performance of MARVEL Blades on every kind of material is evidence that we're right.

Use MARVEL Blades on your power hack saws with perfect confidence that they have no equal. You can get MARVEL Blades at your nearby Industrial Distributor.



Write for the new  
**MARVEL Cutting Tool  
Bulletin.**

**ARMSTRONG-BLUM MFG. CO.**  
5700 W. BLOOMINGDALE AVE. • CHICAGO 39





# Hard Sell Program Gets Results

## DoALL Uncorks Big Sales Gun in Prospects' Plants

**There are any number of ways a tool builder can conduct a 'hard sell' program.**

**Some ways work better than others. For DoALL, in-plant demonstrations are paying off.—By E. J. Egan, Jr.**

■ Here's a machine tool builder with a forceful sales promotion program designed to end the recession for itself and its customers. It's the DoALL Co., Des Plaines, Ill., builders of band machines and gaging devices.

Heart of the program is a series of on-the-spot demonstrations of new band machines in the plants of customers and prospects. DoALL aims to prove that its modern equipment will produce at rates averaging 650 pct higher than 10 years ago.

**Management's Privilege** — Consumer industries must improve their products and profits without increasing prices, says R. J. Wilkie, DoALL president. To do this doesn't give these industry managers much choice, he emphasizes. "Improved production means are among the very few prerogatives open to management," he claims.

Wilkie sizes up the situation this way: "If the tremendous strides made in machine tool production during the last decade were applied to the production of goods, we would be experiencing the greatest boom of all times instead of a recession."

**Visual Proof**—Believing that the best sales offense demands "proof, not words," DoALL recently threw its "Headliner" sales project into high gear.

The program is in two parts. Part 1 is an attention-compelling visual display that the salesman sets up in a customer's office. It offers proof, in actual inches of saw-cut length, that band machining is indeed far faster than it was 10 years back.

**Gets Results**—To convince any production men who might doubt either the claim or the evidence, DoALL literally wheels in its big sales gun. This is a modern band machine mounted on a trailer. It demonstrates its high speed advantages right before the prospect's eyes, in his own plant, and on his own products.

"These two steps show what we

have to sell and why the customer should buy," Wilkie says. And, "The results show that the positive approach does work."

### Ex-Cell-O Buys German Firm

To firm up its position in the European Common Market, Ex-Cell-O Corp. has just bought a German machine tool concern, Werkzeugmaschinenfabrik Geoppingen G.m.b.H. (See page 43). The new company, located in Geoppingen, Wuerttemberg, builds lathes, medium size planers, and textile looms.



**PROOF OF PERFORMANCE:** To show band machine productivity, DoALL mounts latest models on trailers, wheels them into customer plants.

## INDUSTRIAL BRIEFS

**Plant Expansion**—Ransburg Electro-Coating Corp., a pioneer in the field of electrostatic spray painting, has moved into a new building located northwest of the Indianapolis city limits, at 3939 W. 56th St. The new facility is part of a \$1½ million expansion and building program.

**Hands Across the Sea**—Consolidated Electrodynamics Corp., Pasadena, Calif., and Elliott-Automation Ltd., London, England, have concluded an exclusive licensing agreement under which the British firm will manufacture and market certain analytical and control instruments of CEC design.

**Completed Goal**—Vulcan Mold & Iron Co., Latrobe, Pa. has completed a 2-year expansion which raises productive capacity by 40,000 tons to 185,000 tons yearly and improves operating efficiency. Cost was in excess of \$500,000.

**New Oxygen Plant**—Air Reduction Sales Co., New York, division of Air Reduction Co., Inc., is building a new oxygen and nitrogen plant at Denver, Colo. Estimated cost of the Airco facility, including related distribution equipment, will be in the neighborhood of \$600,000.



**"I want to be absolutely fair about this, so let me hear your side of it before I blow my top."**

**Keene for Bearings**—The addition of a 50 pct increase in manufacturing space has been completed at the Miniature Precision Bearings, Inc. plant at Keene, N. H. The 25,000 sq ft addition was erected at a cost of \$300,000, making it possible to offer 30-day delivery lead time on bearing orders.

**Whirly Bird Control**—Gyrodyne Co. of America, Inc., has awarded Lear, Inc., Grand Rapids, Mich., a purchase order to build a prototype remote control system for the Gyrodyne XRON-1 Rotorcycle. The Rotorcycle, a coaxial rotor one-man helicopter, will be fitted with a Lear automatic flight control system which in turn will be radio-controlled from the ground.

**Down to Earth**—A new, continuous process to produce zinc as a thin foil has been developed by American Smelting & Refining Co. at its Central Research Laboratory, S. Plainfield, N. J. In the new method, zinc is deposited electrolytically from a zinc sulfate bath onto a revolving drum.

**Full House**—The Supplies Div. of IBM Corp. has begun construction of a new card manufacturing plant on site recently purchased by IBM in Concord, Mass. The Division manufactures and markets materials and supplies used in the operation of IBM machines and devices.

**Swiss Movement**—Westinghouse International Atomic Power Co., a subsidiary of Westinghouse Electric International Co., has been established in Geneva, Switzerland, to serve the nuclear power needs of Euratom and other European countries.

**Rolling Ideas**—A trailer full of new ideas in the accessory field will be sent by AC Spark Plug Div. to make the rounds of automotive manufacturers. Included in the display are a new kind of speedometer and other instruments. Details will be withheld from the general public until manufacturers have had a chance to see the new products.

**Far East Contract**—Dravo Corp., Pittsburgh has a contract to supply five custom-engineered oil lubricating systems for installation on a new merchant and rod mill to be erected at Burnpur, India, for the Indian Iron & Steel Co., Ltd. The mill will be designed and built by Morgan Construction Co., Worcester, Mass.

**Place In The Sun**—Continental Can Co. will expand its Tampa, Fla., can plant with the addition of a 25,000 sq ft warehouse. Construction will start immediately and completion is scheduled by the end of the year.

**Cinema Honor**—A film produced by Western Reserve University Documentation and Communication Research Center in cooperation with the American Society for Metals was chosen for showing at special meetings during the Edinburgh International Film Festival, Scotland, Aug. 24 to Sept. 14. The film's title: "The Metals Information Center of Tomorrow."

**Mechanized Work Detail**—Clark Equipment Co.'s Industrial Truck Div. received a \$1.3 million order from the Army for 400 fork-lift trucks. All are gasoline powered and of 4000 lb lifting capacity. Delivery will begin Nov. 1.

**Lox For L. A.**—Ground-breaking for a \$1,750,000 liquid oxygen, nitrogen, and argon plant in Los Angeles to expand its West Coast industrial gas production was announced by the National Cylinder Gas Div. of Chemetron Corp. Similar plans to extend NCG liquid oxygen production to the East Coast were announced in May when the company began construction of a new plant at Philadelphia.

**Mexican Steel Drive**—A 44,000 kw power plant to run five new rolling mills for Latin America's oldest steel mill was sold by Westinghouse in a \$3 million order to Compania Fundidora de Fierro y Acero de Monterrey, S. A. The Mexican firm is completing purchasing for a 10-year, \$60 million expansion program begun in 1950.



# Vasco

first quality modern

# high speed steels

Specify These Modern Steels

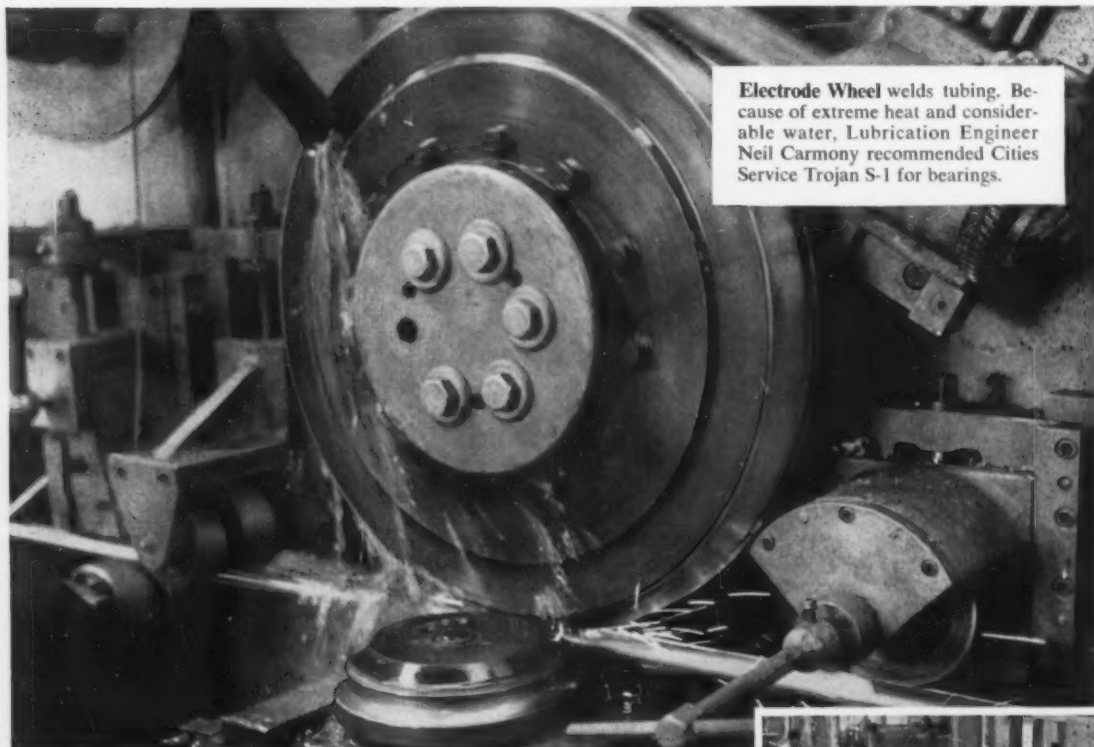
Vasco Supreme  
Vasco M-2  
Van Lom  
Neatro  
Van Cut  
8-N-2  
Red Cut Superior

In these fine steels, metallurgical progress, manufacturing specialization and integrity combine to provide performance leadership known everywhere. Ask for Data Sheets discussing your applications.

## Vanadium-Alloys Steel Company LATROBE, PENNSYLVANIA

**SUBSIDIARIES:** Anchor Drawn Steel Co. • Colonial Steel Co. • Metal Forming Corporation • Pittsburgh Tool Steel Wire Co. • Vanadium-Alloys Steel Canada Limited • Vanadium-Alloys Steel Societa Italiana Per Azioni • **EUROPEAN ASSOCIATES:** Societe Commentryenne Des Aciers Fins Vanadium-Alloys (France) • Nazionale Cogne Societa Italiana (Italy)

# New Tubing Mill Produces at Speed of 350 Feet Per Minute!



## It's Cities Service for Hydraulic System and all lubrication

On January 1, 1957, P&H Tube Corporation put a new mill in production at Bossier City, Louisiana—the only one of its kind in the United States.

Equipped with special drives and worm gears, this unique mill actually produces at the rate of 350 feet per minute—twice the speed of conventional tubing mills!

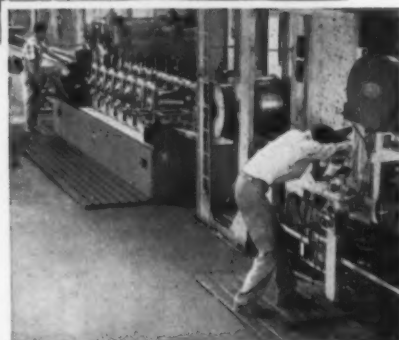
With speeds like this, you might expect lubrication troubles . . . but P&H Tube Corporation has none. One big reason is the careful study of each machine made by Cities Service Lubrication Engineer Neil Carmony—and the lubrication recommendations he made.

In hydraulic units, for example, Carmony recommended Pacemaker 200-T Hydraulic Oil . . . for he knew its ability to withstand the severest op-

erating temperatures and speeds. He knew that due to its exceptionally high viscosity index and superior compounding, Pacemaker 200-T would give maximum resistance to thinning, oxidation, rust and corrosion.

The wisdom of this decision, as well as the choice of other lubricants shown in the chart at right, was demonstrated recently when P&H Tube Corporation ran off 125,000 feet of tubing in an ordinary eight hour shift—with normal time-out for change-overs!

That's production with a capital P! And if you'd like to improve your production picture, a Cities Service Lubrication Engineer can help you, too. Call the nearest office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.



### What the Cities Service Lubrication Engineer Recommended

Hydraulic units	Pacemaker 200-T
Bearings	Trojan H-2 Grease
Drive units	Pacemaker Oils
Bearings by the mill's electrodes	Trojan S-1

# CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

Visit Booths 46-47-48, Iron & Steel Exhibit, Public Auditorium, Cleveland, Ohio, September 23-26



## MEN IN METALWORKING



**Dr. E. E. Reynolds**, named chief metallurgist, Alloy Research and Development Section, Brackenridge, Pa., Research Center, Allegheny Ludlum Steel Corp.

**J. M. Morris**, named vice president, F. H. McGraw & Co., New York.

**F. T. Majewski**, appointed executive vice president, and **J. O. Wagner** as sales manager, The Hicks Corp., Hyde Park (Boston), Mass.

**Robert Zufra**, elected asst. treasurer, National Metal Abrasive Co., Cleveland.

**G. J. Fehrenbach**, promoted to executive vice president, Speer Carbon Co.; **W. A. Keating**, promoted to treasurer.

**H. V. Bootes**, appointed president, Shippers' Car Line Div., ACF Industries, Inc.



**Irwin Koenig**, elected vice president and director, engineering, Foote Bros. Gear & Machine Corp.

**S. E. Young**, appointed executive vice president, Barrymount Corp., wholly-owned subsidiary of Barry Controls, Inc.

**R. D. Olson**, promoted to manager, magnetic application section, Materials Engineering Depts., Westinghouse Electric Corp., E. Pittsburgh.

**R. M. Draper**, appointed manager, New York office, The Osborn Mfg. Co., Cleveland.

**James Ralph**, promoted to supervisor, Labor Relations Dept., Jones & Laughlin Steel Corp.'s Pittsburgh Works; **J. J. Felker**, named asst. supervisor.

**E. T. Walton**, named manager, customer technical services, Metallurgy Div., Technology Dept., Crucible Steel Co. of America, Pittsburgh; **J. A. Kearney**, appointed manager, materials and processes.

**A. P. Stanton**, named warehouse manager, Rhode Island Div., Eastern States Steel Corp., Westerly, R. I.

**R. W. Allen**, appointed asst. superintendent, Struthers, O., Merchant Mills, Youngstown district, The Youngstown Sheet & Tube Co.



**K. P. House**, appointed manager, Wheeling Steel Corp.'s Tubular Sales Div.



**C. W. Massie**, appointed general manager, Construction Machinery Div., Clark Equipment International, C. A., wholly-owned subsidiary of Clark Equipment Co.

**W. P. Kesel**, appointed export manager, Hewitt - Robins, Inc., Stamford, Conn.

**A. A. Milkie**, appointed manager, Chicago district, Pangborn Corp., Hagerstown, Md.

Following appointments are within the Central Engineering Div., Consolidated Electrodynamics Corp., Pasadena, Calif. **F. T. Greenup**, named manager, engineering services and manager, Alec-



**M. S. Bandoli**, elected senior vice president, Pendleton Tool Industries, Inc.

When you want **ALUMINUM SHEET**...



# CALL REVERE!

You can be sure, when you specify or order from Revere, that you will get not only fine metal but fine service, including Revere's cost-saving Technical Advisory Service if desired. Revere—now an integrated producer of aluminum—can supply you from large modern sheet mills in Baltimore, Md., and Chicago, Ill.

In addition to aluminum coiled and flat sheet, circles and blanks, both plain and embossed, Revere can furnish aluminum seamless drawn, welded and extruded tube; extruded shapes; forgings; foil; and primary aluminum pig and ingot.

It pays to do business with the most dependable sources of supply—such as Revere, which has been fabricating fine non-ferrous metals for more than 150 years.

Revere Aluminum Coiled and Flat Sheet  
up to 48" wide and up to .125" thick

Alloys			
1100	3003	5005	5052
1145	3004	5050	5357



**REVERE COPPER AND BRASS INCORPORATED**

*Founded by Paul Revere in 1801*  
230 Park Avenue, New York 17, N. Y.

tra Dept.; **G. M. Slocumb**, promoted to asst. chief development engineer, and **E. J. Penrose**, named administrative manager.

**F. B. Mitchum**, appointed purchasing agent, Atkins Saw Div., Borg-Warner Corp., Indianapolis, Ind.



**R. P. Hindman**, appointed general superintendent, Butler Works, Armco Steel Corp., Butler, Pa.

**Philip Balaban**, appointed director, research, Mid-Century Instrument Corp., New York.

**J. C. Irwin**, promoted to resident manager of sales, Seattle, Jones & Laughlin Steel Corp.



**W. J. Nichols**, named materiel manager, Ryan Aeronautical Co.

**G. C. Kirker**, named plant manager, Montebello Div., Western Design & Mfg. Corp., Santa Barbara and Montebello, Calif.

**T. H. Thoresen**, appointed field sales manager, Hannifin Co., Des Plaines, Ill., a division of Parker-Hannifin Corp.

**A. L. Kenn**, appointed consumer products marketing manager, Alkaline Battery Div., Gulton Industries, Inc., Metuchen, N. J.

**G. T. Grimstad**, appointed sales manager, Bendix Filter Div., Bendix Aviation Corp., Madison Heights, Mich.

**B. L. Fielding**, appointed manager, engineering sales, Electronic Systems Div., Dalmo Victor Co., Belmont, Calif.

**J. D. Lowery**, appointed asst. general sales manager, Industrial Chemicals Div., American Cyanamid Co., New York.



**W. W. Henderson**, elected vice president, sales, Robinson Ventilating Co., Zelienople, Pa.

**D. A. Black**, named sales manager and **P. J. Jellison**, promoted to assistant to the president, Fabricated Products Co., Inc., West Newton, Pa.

**Edward Proctor**, named general manager, Western Rolling Mills, Yuba Consolidated Industries, Inc., San Francisco.

**Robert Steinbruch**, appointed manager, contract research, Minerals & Chemicals Corp. of America, Menlo Park, N. J.

Following appointments are within the Chemical and Metallurgical Div. of General Electric

## GREATER MILEAGE

Malleabrasive goes for "greater mileage"—retains its grade particle size longer, has longer cleaning life, because of its own exclusive metallurgical structure—present in no other metal abrasive.

Its tough, shatter-resistant structure makes it go for greater mileage and provides its slow breakdown rate and consequent minimum "fines". Fewer fines mean faster cleaning, less destructive action on machine parts, and lower over-all cleaning costs.

You should know the full story about Malleabrasive and what it can do for you. Write us.



THE GLOBE STEEL ABRASIVE CO.  
Mansfield, Ohio

Sold by Pengborn Corp., Hagerstown, Md., and by many leading distributors of foundry supplies from coast to coast.

MALLEABRASIVE

## Problem-Solving Products from Republic

# MEET REQUIREMENTS FOR DEPENDABILITY, STRENGTH, ECONOMY, CLOSE TOLERANCE



REPUBLIC ALLOY STEELS ADD DEPENDABILITY, TOUGHNESS, STRENGTH, QUALITY TO A PRESTIGE PRODUCT. Axle shafts and connecting links produced by The U.S. Axle Company, Inc., Pottstown, Pennsylvania, are known throughout the world for their extra stamina to withstand emergencies as well as everyday use.

To maintain their reputation for quality and dependability, U.S. Axle specifies only the finest materials, including Republic 4300 series hot rolled Alloy Steels.

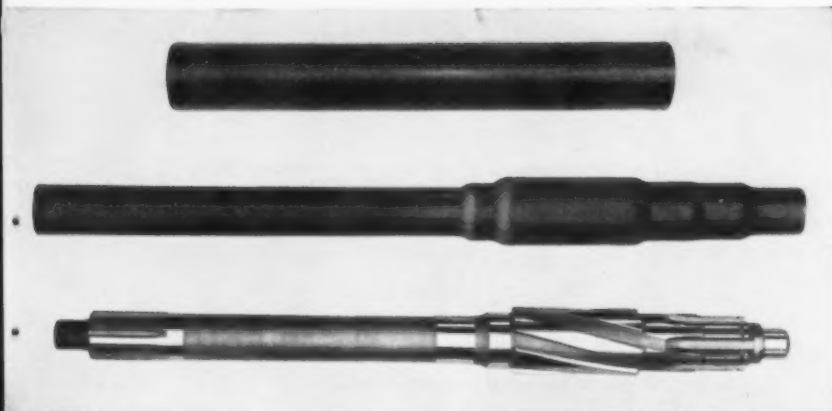
These finest of steels provide the high strength, toughness, shock-resistance, and abrasion-resistance values needed to withstand the severe service to which the shafts and links are subjected. Alloy Steel's uniform response to heat treatment gives these parts hard sur-

faces around tough cores, providing maximum resistance to abrasion, friction, and wear.

In Republic Alloy Steels you will find the highest strength values—plus an exceptionally high strength-to-weight ratio that permits the design of thinner sections to save weight and hold down size without any sacrifice of needed strength.

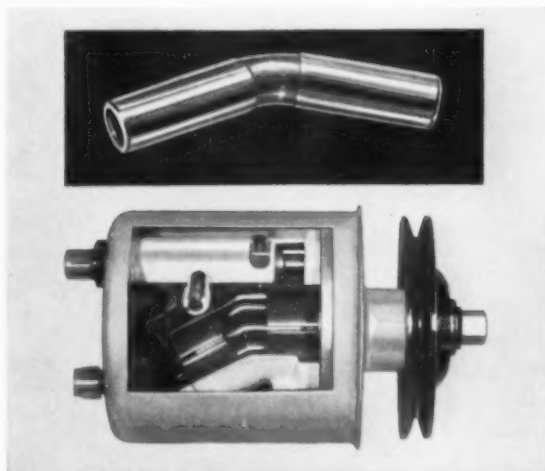
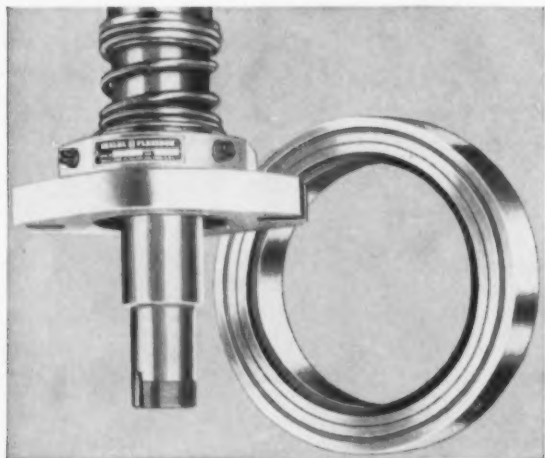
Specify Republic Alloy Steels to insure safety, to extend equipment life, to cut maintenance and replacement costs. Specify Republic Alloy Steels where strength and toughness must resist heavy-duty roughness. We offer you the services of our experienced field metallurgists to help you get the most from these versatile steels at the lowest possible cost. The coupon is your invitation to their services.





**REPUBLIC DIE-FORM MEANS ECONOMY.** This new fabricating process can save you 1 out of 3 tons of steel. The automotive transmission shaft, shown at left, proves the point. Using Die-Form, 200 tons of cold finished blanks produced parts formerly requiring 300 tons. Die-Form is a new method of cold forming hot rolled carbon, alloy, or stainless steel bars into multi-diameter blanks ready for final machining. It permits major savings in time, material, and money in mass produced, multi-diameter machine shafts. Since Die-Form closely approximates the final part, only finishing cuts and/or grinding are required for completion. Scrap loss is minimized—production rate increased. Send coupon for booklet describing the advantages of this new process.

**REPUBLIC ENDURO® STAINLESS STEEL BARS** provide a machine finish that looks as good as a ground finish. That's the performance report from machine operators at Sealal Corporation, Providence, Rhode Island. The company uses Free-Machining ENDURO bars in manufacturing mechanical shaft seals for application on fuel tankers, and in the aircraft, petroleum, food and chemical industries. The Sealal machine operators also report that they like the machinability of ENDURO bars—the fine surface finish, the accuracy of section, the uniform soundness, the ability of ENDURO to hold close tolerances. Send coupon for complete facts on Free-Machining ENDURO Stainless Steel Bars.



**REPUBLIC ELECTRUNITE® MECHANICAL TUBING** meets all close tolerance requirements for new automotive pump (above). The unusual ductility, uniformity, and workability of ELECTRUNITE Mechanical Tubing also meets the performance requirements of this hydraulic power pump designed and assembled by Thompson Products, Inc., Cleveland, Ohio. Will-O-Hill Industries, Inc., Willoughby, Ohio, subcontractor and specialist in close tolerance tubular stampings, cut 7/8-inch diameter ELECTRUNITE into units 23 1/2 inches long. Each unit is rolled to form a slight groove in the center, and bent to an angle of exactly 150°. Both ends are subsequently bent in a die, held to a tolerance of  $\pm .0005$  inches and finished to an O.D. to  $\pm .0003$  inches. Republic Engineers will work with you in solving precision problems and reducing costs with ELECTRUNITE Mechanical Tubing. Send coupon today.

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of Standard Steels and  
Steel Products*

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Send more information on:

- ☐ Die-Form ☐ ENDURO Stainless Steel Bars  
☐ ELECTRUNITE Mechanical Tubing  
☐ Have an Alloy Metallurgist call.

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Co. at Pittsfield, Mass. **Dr. A. E. Schubert**, appointed general manager, Chemical Materials Dept.; **S. L. Brous**, named marketing manager; **J. W. Reynolds**, assigned as a consultant to the general manager of the division.

**C. W. Lueders, Jr.**, appointed sales and service engineer, The Herman Pneumatic Machine Co., Pittsburgh.

**D. G. Vincent** and **W. R. Toye**, appointed sales representatives, engineering products section, Special Products Div., I-T-E Circuit Breaker Co., Philadelphia.

**V. V. Schlosser**, appointed manager, engineering, Westinghouse Electric Corp.'s Atomic Equipment Dept., Cheswick, Pa.

**E. S. Evans**, appointed engineer-in-charge, project section, and **R. E. Ferber**, supervisor production planning section, Allis-Chalmers Steam Turbine Dept.

**F. T. Miller**, appointed regional sales manager, Weston Hydraulics, Ltd., subsidiary of Borg-Warner Corp.

**N. L. Carney**, named asst. safety supervisor, Engineering Works Div., Dravo Corp.

**J. E. Allen**, **P. C. Hintz** and **G. B. Ross**, appointed sales representatives, Michigan Seamless Tube Co., S. Lyon, Mich.



**F. G. Gregory**, appointed asst. superintendent, Openhearth Div., Bethlehem Steel's Lackawanna, N. Y., plant.



**P. E. Mitchell**, appointed industrial sales engineer, The De Laval Separator Co., Poughkeepsie, N. Y.

**W. F. Zunker**, appointed sales manager, Industrial Boiler Div., Cleaver-Brooks Co.

**R. H. Gorman**, appointed manager, product planning, General Electric's Distribution Assemblies Dept., Plainville, Conn.

**A. L. Thurman**, named manager, West Virginia Works, Connors Steel Div., H. K. Porter Co., Inc.

**J. C. Hampson**, appointed regional manager, Pittsburgh office, Pennsalt Chemicals Corp.'s Industrial Div.

**C. R. Wallander**, has joined the staff of Arco Industrial Co., Inc., New York.



**T. S. McCrory**, appointed regional manager, Wheelabrator Corp.'s West Coast sales organization, Los Angeles headquarters.



**J. C. Zuk**, appointed purchasing agent, Superior Steel Div., Copperweld Steel Co., Carnegie, Pa.

**H. J. Dempsey, Jr.**, appointed sales manager, Easton Car & Construction Co., Easton, Pa.

**T. F. David**, named sales engineer, northern Indiana, Brainard Rivet Co., Girard, O.

**H. R. MacLeod**, appointed chief engineer, Colson Corp.'s new Jonesboro, Ark. plant.

**D. J. Goodreau**, appointed plant engineer and **William Cord** as product design engineer, Adams Engineering Co., Inc., Miami, Fla.

**B. L. Stewart**, appointed general manager, Guide Lamp Div., General Motors, Anderson, Ind.

**J. C. Talbott**, named district industrial engineer, Republic Steel Corp.'s Youngstown plant.



**Price Berrien**, elected vice president and sales manager, Anti-Corrosive Metal Products Co., Inc., Castle-on-Hudson, N. Y.

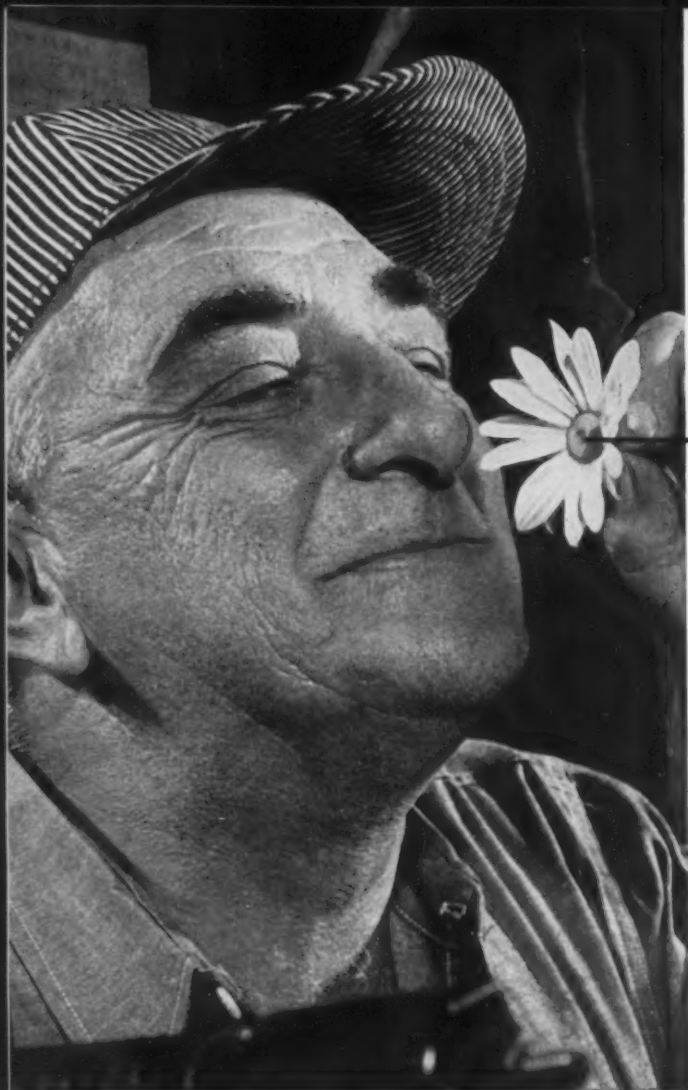


DISCOVERED!

...new way to keep cutting fluids  
as fresh as a daisy!



SEE NEXT TWO PAGES 



DISCOVERED... A NEW  
WAY TO KEEP COOLANTS  
FRESH AS A DAISY!

Shop tests show  
**ELCIDE 75**  
keeps cutting  
fluids  
fresh longer  
than ever before

Now... there's a new and better way to control the harmful bacteria that cause oil-water emulsion breakdown, acidic corrosion, and rancid odor. It's Elcide 75... a product directly related to one of the most powerful bacteria killers used in medical science today... a material that has proved itself in the exacting field of surgical practice and has now been adapted to solve the problem of bacterial growth in soluble oil emulsions.

A large Midwestern manufacturing plant tested Elcide 75 under actual job conditions.

They found that one ounce of Elcide 75 added to each 4 gallons of oil-water emulsion...

extended useful life of the emulsion  $5\frac{1}{2}$  times...  
greatly reduced cutting oil requirements...

delayed odor and emulsion break for 22 weeks, while untreated machines had to be dumped at the end of four weeks...

proportionately reduced down time for recharging...

was safe and nontoxic...

eliminated bacterial slime and reduced acidic corrosion...

drastically reduced their disposal problems.

#### WHAT ELCIDE 75 CAN DO FOR YOU

This combination of inhibitors can extend the life of your oil-water emulsions 2 to 4 times, or more, and can dramatically cut your oil-concentrate purchases. At the same time, production will increase because you have less down time for recharging.

ELI LILLY AND COMPANY • AGRICULTURAL AND INDUSTRIAL PRODUCTS DIVISION  
INDIANAPOLIS 6, INDIANA

TELEPHONE: MELROSE 6-2211





**This is one of the causes of emulsion trouble.** These are *Pseudomonads*, one of the many harmful types of bacteria found in oil-water emulsions. These, and other bacteria, enter emulsions through the air, water, and plant debris. They set the stage for a chain reaction which causes odor, corrosion, and costly emulsion breakdown.

Prior to Elcide 75, no single inhibitor was able to control the full range of bacterial growth. Certain of these bacteria quickly develop resistance to single inhibitors and continue to flourish. Now, Elcide 75 controls a wider range of bacteria because it is an effective combination of bactericidal agents. This has been proved in shop tests.

In certain areas where waste-oil disposal is a problem, the use of Elcide 75 proportionately reduces the size of the problem.

Elcide 75 also contributes to better products and longer machine-tool life. Bacterial contamination causes acidic decomposition of the emulsion and sets up conditions for corrosion. By controlling the bacteria, you eliminate this source of trouble.

Employees like Elcide 75 because, when added to the emulsion, it is completely safe. In another recent test involving over 1000 machines, it was shown that Elcide 75 was safe, nontoxic, and harmless to sensitive skin. It also reduces the chance for bacterial infection caused by contaminated emulsion.

#### **YOU KNOW WHAT YOU GET WHEN YOU BUY ELCIDE 75**

With Elcide 75, you know you have the proper amount for effective treatment because you add it to your emulsions right in your plant. The standard recommendation is one ounce of Elcide 75 per 4 gallons of oil-water emulsion.

#### **PROVE IT TO YOURSELF... TRY ELCIDE 75 IN YOUR PLANT**

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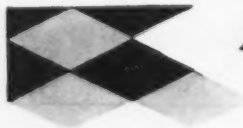
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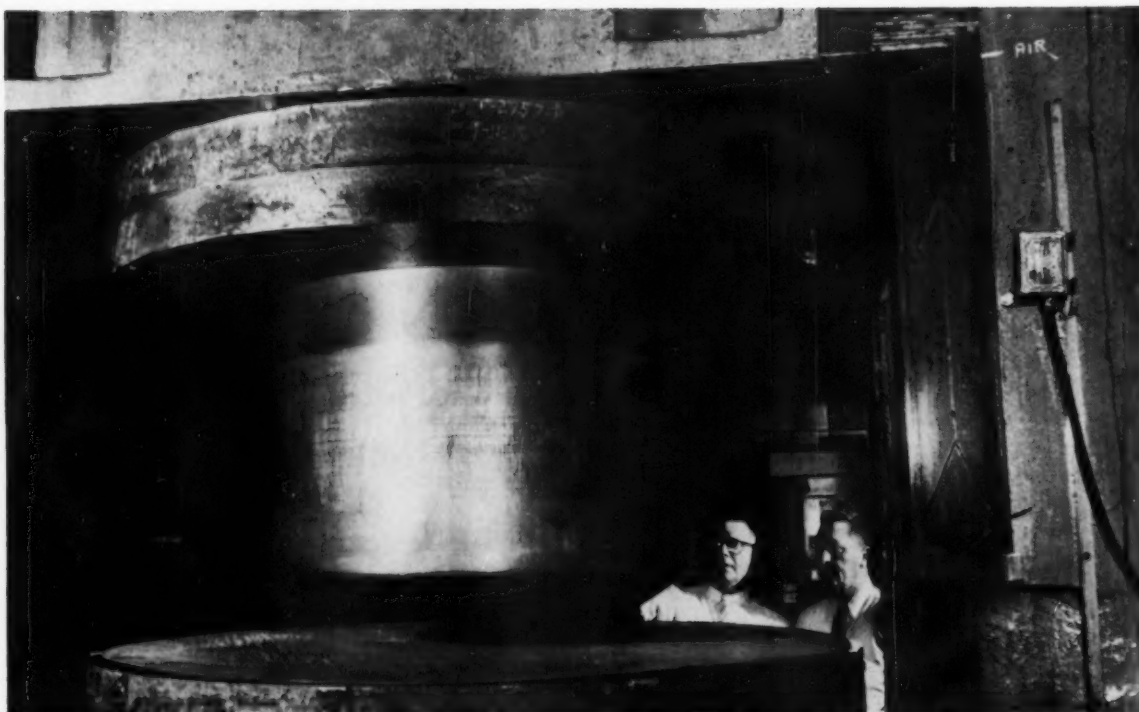


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**READY TO GO:** Circular blank of tool steel is ready for first cup-forming operation on missile motor casing.

## Tool Steel Bows to Deep Drawing

**Is it possible to deep draw tool steel?**

**The bulk of expert opinion said it couldn't be done. The obstacles seemed insurmountable.**

**Here's the first report on how it is being done—now.**

**By P. M. Unterweiser—Metallurgical Editor**

■ By combining metallurgical research and shop "know how," a major metalworking breakthrough was made and is now a production reality. An AISI type H-11 tool steel (5 pct chromium) is now being deep drawn at room temperatures to form missile motor cups about

28 in. in diameter and up to 52 in. long.

Although of critical importance to defense, the missile application alone is of limited scope. But the potential—the very fact that a tool steel can be deep drawn—is of major significance to the metalworking industry.

**Opens Door**—Its impact upon both tool steel production and the spread of new applications is likely to be felt for years to come. What it does essentially is to open the door to the use of tool steels where these materials could never be used before.

The new development is credited to Scaife Company and Mellon Institute, both of Pittsburgh. It was arrived at cooperatively, with Scaife providing production facilities and

sponsorship through a Thiokol Chemical Corp. contract. Mellon Institute handled the engineering and metallurgical research.

**Fuel Switch**—Interest in higher strength steels for missile motor casings came hand-in-hand with the switch from liquid to solid fuels. Solid fuels develop tremendous pressures as they burn. These pressures, in turn, provide great thrust, enabling missiles to extend speed, range, and reliability.

A suitable casing must be strong enough to safely withstand these pressures. Also, the less it weighs, the greater is its ratio of fuel carrying capacity to weight, thus extending its range.

**Need Strength**—In almost all respects, the strength requirements

## Success depends on close control and material quality

point to the use of either high-strength alloy or tool steels. To save weight and simplify fabrication, deep-drawing seems to offer the most logical approach. In addition, the deep drawing process comes with a built-in method for "self-inspection." The part rejects itself when the steel fails to draw properly.

The major hitch to cashing in on all these advantages has been the almost impossible drawing qualities of the nickel-bearing types of low-alloy and tool steel needed for maximum strength. This hurdle has now been cleared to the extent that even a tough, heat treatable, 5 pct Cr tool steel can be satisfactorily deep drawn.

**Large and Small**—At the moment, Scaife is turning out two types of rocket motor cases in tool steel. A smaller model—intended for air-to-air missiles—has a 6-in. diam, a 0.050-in. side wall thickness, and is 26 in. long. A motor case for a surface-to-air missile is considerably larger. It has a 28-in. diam, a maximum wall thickness of 0.075 in., and measures 8 ft in length before trimming.

Big as this motor case is, still larger versions are planned for the future. The developers feel confident that diameters up to 5 ft should be entirely feasible.

**Welded Assembly**—With the larger casings, the final assembly consists of two trimmed, deep-drawn and ironed casings girth welded together to form a long, hollow cylinder. Fuel and other motor apparatus are housed within the casing at one end. Forward of the other end are guidance equipment and warhead. Along with high strength requirements, cases must have enough ductility to avoid brittle failure.

Two factors predominate in de-

termining whether or not the H-11 tool steel can be successfully used in rocket motor cases. In the first place, the quality of the sheet must meet rigid requirements. Secondly, the material should respond readily to fabrication by deep drawing and welding. After heat treatment, it should produce desired strength levels coupled with adequate ductility.

**Start With Disk**—The drawing process begins with the blanking or circle shearing of a disk from H-11 steel sheet. For the large casings, the disk diameter is upwards of 6 ft and all edges are deburred before pressing. After shearing, both diameter and thickness dimensions are re-checked.

To provide adequate lubricity and surface cleanliness, disks are scrubbed with steel wool and degreased. There follows a hot water rinse, a pickling operation, and another rinse to remove pickling solution contamination. The disk is then phosphate coated, rinsed in cold water, and coated with a special lubricant.

**Two Draws**—The disk is now placed in a 1500-ton press, ready for the first drawing operation. Both disk and die are further lubricated. After the first-stage draw, the cup-shaped part is stress-relieved at 1450°F for 1 hour. To prevent decarburization, the part is covered with a protective coating.

Virtually all of these same steps are repeated for the succeeding drawing operations. Before assembly and heat treating, the casings are trimmed to size and subjected to "ironing" operations as required. The main purpose of ironing is to provide a uniform wall thickness not obtainable in drawing alone.

**Hardening Pointers**—The sheet material is obtained and initially processed in the spheroidized annealed condition. It tends to harden somewhat as a result of the cold working encountered in forming operations. Normally, the surface hardness of the casings after a final stress relief treatment is about

Rockwell "B" 95-105. In this condition, they are ready for the hardening operation that provides them with high strength and toughness.

Hardening consists of heating to the 1860°F austenitizing temperature and controlled cooling down to 1000°F. During the heating cycle, decarburization is avoided by providing a prepared carbonaceous atmosphere with proper dew point control. The casings are fixtured to minimize distortion.

**Use CO<sub>2</sub>**—Cooling to 1000°F is accomplished with controlled streams of carbon dioxide gas that insure a uniform rate of cooling throughout the motor case. Since the unit has a variable section, only accurate control of cooling rate can avoid thermal upsetting at the junction point of heavy and light sections.

After hardening, casings are tempered for three consecutive 3-hr periods in the range of 1020° to 1080°F. Following each temper, the parts are allowed to cool to room temperature. The same protective coating used in hardening is also applied in tempering.

**Plenty Tough**—Final hardness of the steel is about R<sub>c</sub>55. This provides a minimum yield strength of 235,000 psi. Elongation is roughly 5 to 6 pct. At this particular strength level, there is no danger of embrittled failure.

So much for the details of the actual processing. But processing techniques alone are not the key to the satisfactory deep drawing of tool steel. Success or failure depends in large part upon close control in the manufacture of the material. In fact, the importance of using only that material which can meet required drawing quality standards cannot be overstressed.

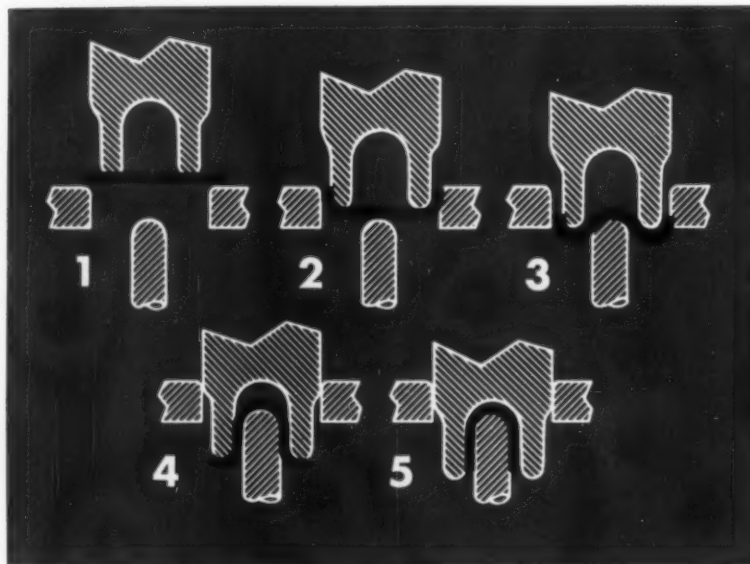
**Check Material**—In the opinion of Mellon Institute metallurgists, here are some of the basic material requirements that must be adhered to:

1) Spheroidization—For best drawability, the steel must be spheroidized in the range of 90 to 100 pct complete. This makes both



# How Reverse Draw Method Works

1. Circular blank is fed onto press draw ring.
2. Ram descends and hollow punch begins to form sheet into cup.
3. Ram descends more, drawing cup between end of hollow punch and spring-backed ring. Pressure forces cup over solid punch.
4. Cup turns inside out.
5. Cup forms at end of stroke.



conventional and reverse drawing easier and provides a casing with a more uniform wall section. It both allows and assists the mobility of the ferrite in its plastic deformation during drawing.

2) Inclusion rating—A high inclusion rating is harmful in any highly stressed structure. As a general rule, the inclusion rating of a heat of steel should not exceed 4 according to ASTM specification E45-51.

3) Hardness — To some extent, hardness reflects the extent to which spheroidization has been completed. When hardness is less than Rockwell B 90, drawing and reverse re-drawing performance is generally good. Because low hardness may result from decarburization, the metallography of the material must also be checked.

4) Chemical composition—Nominal chemical composition of H-11 tool steel is: 5 pct Cr, 0.30 pct Mn, 1.4 pct Mo, 0.4 pct V, 1 pct Si, and 0.40 pct C. Heats low in both phosphorous and sulphur provide the best drawability, weldability, and structural strength. They also pro-

duce the best surface finish.

5) Grain size—Best drawing performance is generally obtained with grain size in the range of 6 to 8. Grain size is very important in developing uniform wall thickness. Coarse grained material, in addition to being less drawable, also tends to produce "orange peel" effect.

6) Segregation—In high performance missile motor casings, particularly, any segregation in thin-wall sections may lead to rupture in drawing operations or in pressure testing. Surface areas that show segregation as a result of piping or laminations should not be used. A severely banded structure is considered detrimental.

7) Hardenability — Samples of all incoming material should be checked for response to heat treatment. Specifically, the steel must respond favorably to the various heat treatments to which it will eventually be subjected in production.

8) Thickness tolerance — Nominal thickness tolerance should be maintained. It assures adequate die clearance so that drawing will not

result in pinching or cut-off due to excessive gage. It also helps to establish uniform ironing operations.

9) Surface finish—Material is not suitable if it is excessively decarburized or contains pits, scale, seams, or slivers. All types of defects must be studied for their possible effect on performance.

10) Ductility — Olsen ductility test may be used to establish minimum values. Material with a nominal thickness of 0.082 in., for example, should show a cup depth of about 0.550 in. under an 11,000-lb load using a  $\frac{7}{8}$  in. diam ball. Press performance is usually satisfactory with this degree of ductility.

11) Tensile strength—In the as-received condition, sheet tensile strength should not exceed 85,000 psi.

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# New Pretreatment Thwarts Rust

By H. W. Adams—Manager, Corrosion Div., Atlantic Laboratories of Delaware, Inc., Wilmington, Del.

**The time to fight underfilm corrosion is before it starts.**

**It can't get a foothold if metal is really rust-free, passivated, non-conductive and well primed.**

**A simple pretreatment system does all four quickly and at low cost.**

■ Because of underfilm rust, many good paint jobs fail long before their useful lives are over. Even though the paint itself is still intact on the outside, a layer of oxide below lifts it off the substrate.

Proper surface preparation will prevent it. First, the metal must be cleaned thoroughly. Next, it should be passivated—the instant it's clean it starts to react with moisture in the air. Then, because galvanic currents are a major source of trouble, the metal should be made non-conductive. And finally, it gets primed to assure a tight, long-lasting bond.

As separate steps, all this can be costly. But to do anything less than a complete job might prove even more expensive in terms of early failures.

**Simpler Way** — Researchers in England have come up with a sys-

tem that cuts down on the number of steps and still achieves the same results. Already in wide use throughout the Commonwealth and other countries, the patented Grayguard system is now being introduced here by Atlantic Laboratories.

The Grayguard method chemically cleans the surface down to bare metal, no matter how heavy the rust or mill scale. Then the metal is passivated, made non-conductive and primed in a single step.

Since it uses cold-applied chemicals and simple hand tools, it's ideal for field and on-site treatment as well as in the shop. Application doesn't interfere with nearby production or pose a threat to delicate equipment in the area. The system also works on non-ferrous metals such as zinc, copper or aluminum.

**Severity Controls Cost**—The operations required, and the cost, will depend on the condition of the steel to be treated. The system consists of three basic materials — Grayguard Descaler No. 2 for removal of heavy, tight rust and rust scale; Grayguard Descaler No. 4 for removal of mill scale (which at the same time removes rust and rust scale); and Grayguard Conditioner-Primer, which chemically treats the steel to prevent further rusting.

For treatment of steel surfaces which have only light rust, a single application of one coat of conditioner-primer will provide very good preparation. It converts the surface oxides to a complex metallic phosphate which becomes part of the prime coat. This application can



◀ **FAST ATTACK:** Underfilm corrosion from mill scale has badly damaged paint after only 11 months in mild South England climate.

be made at a total cost, including material, of about 5¢ per sq ft.

**Cleans Quickly**—Steel which has no mill scale, but is badly corroded and has tight, heavy rust or rust scale may be cleaned down to bare metal by a brush application of Descaler No. 2. This is allowed to stay on the surface until the rust or scale is dissolved, which will take from 45 minutes to a maximum of 4 hours for very thick rust. The surface is then washed down with water, leaving bare, clean steel.

When surplus water has drained off (the surface needn't be dry), one coat of conditioner-primer is applied by brush or spray. This will dry, usually, in less than one hour.

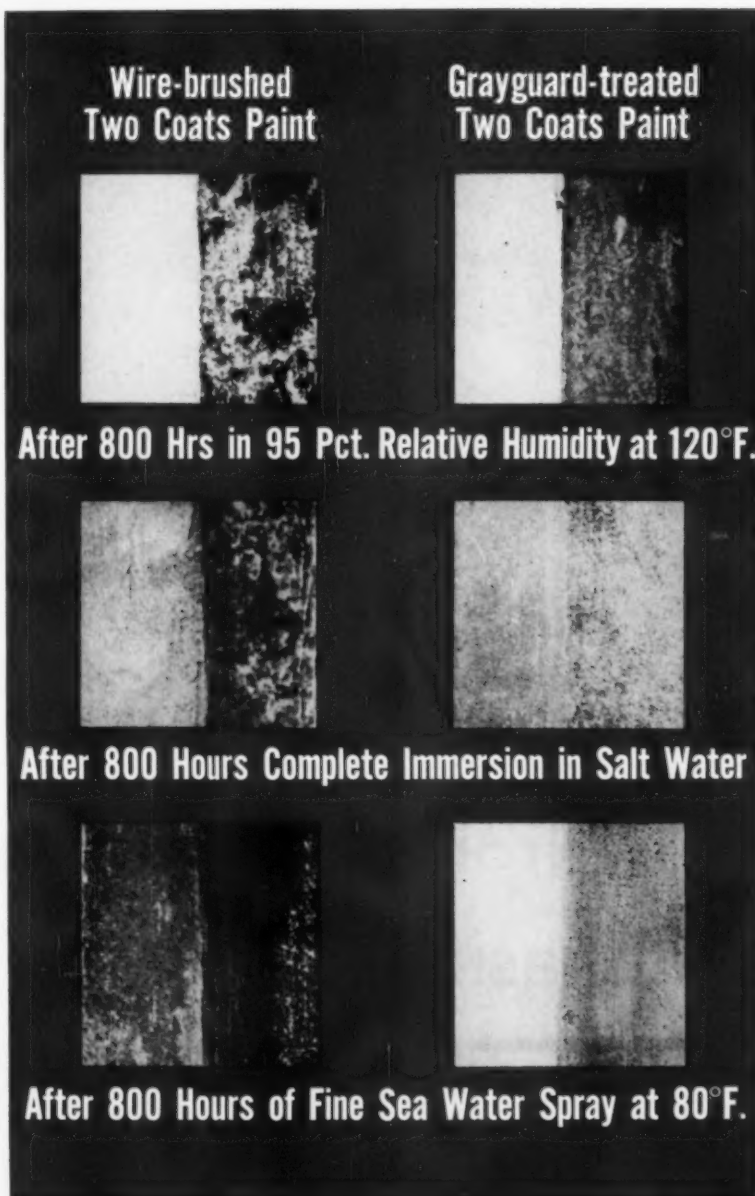
If it isn't feasible to apply paint or protective coatings right away, the Grayguard-primed surface may be left exposed to the weather for long periods without damage. For very long periods, extending into years, conditioner-primer type G is used.

**For Heavy Scale**—Steel which has mill scale on it, in any degree, is treated the same way, but with Descaler No. 4. Most mill scale will be dissolved within a few hours. Even the heaviest scale can be taken off within 24 hours.

Application cost of the complete Grayguard system, where heavy rust or scale is involved, will usually be under 20¢ per sq ft for both materials and labor. Added savings result from the fact that in most cases it does away with a separate prime coat.

A very few protective coating systems require special primers and won't adhere to any other. In such cases, the specified primer will bond to the Grayguard-treated surface.

**Related Parts**—The Grayguard descalers are formulated for fast action; yet, they clean without preferential attack or etching on bare areas of the treated steel. They're designed to be part of a system, not an end in themselves. Used alone, they will remove rust and scale. But, like sandblasting, they leave the steel very reactive.

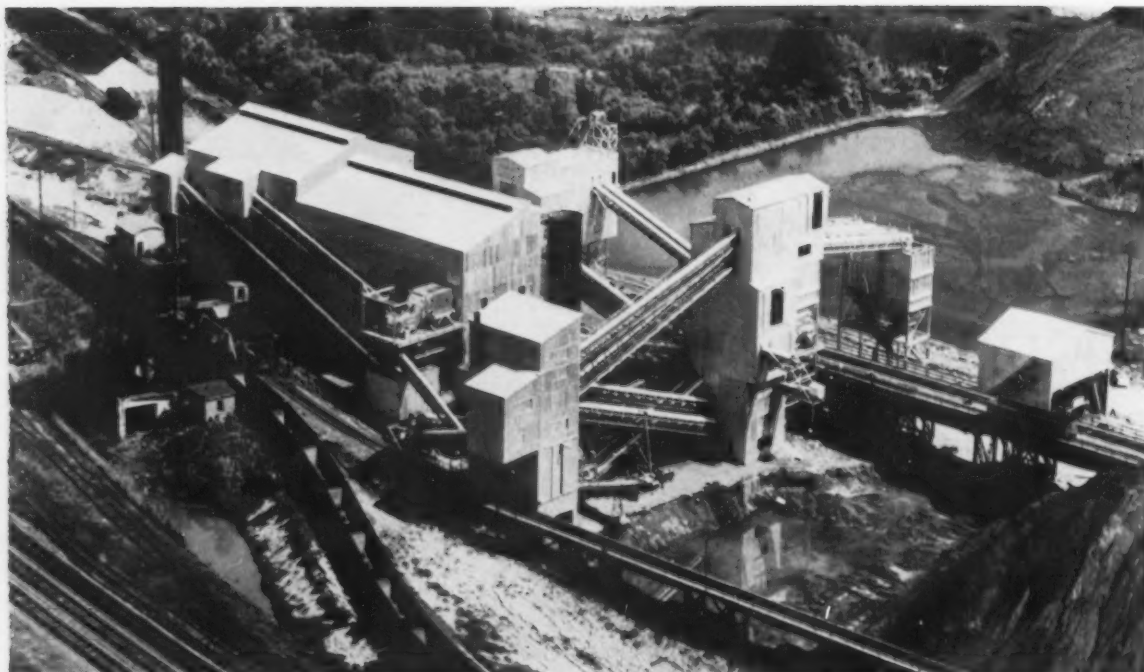


**MARKED DIFFERENCE:** Heavily rusted steel plates were treated as in the column headings, then exposed in what would compare to years of rough service. Right half of each panel is stripped to show effects.

The patented conditioner-primer overcomes this condition. Instead of simply phosphating the steel surface, a complex metallic phosphate coating is obtained. This is not crystalline in nature, nor does it leave any effluorescence or powdery deposit.

The coating is in the steel as well as on it, since the grain boundaries

of the metal are penetrated. The metal surface is immediately made invulnerable to moisture, and is non-conductive. Surface corrosion is prevented. Being an emulsion-base coating, it remains in the water phase long enough for its reactive elements to completely react with the steel. Then it forms a tough and durable protective film.



**PLANNED FOR SAVINGS:** New Armco sintering plant will process 2400 tons of ore and flue dust daily.

# New Iron Ore Sintering Plant Emphasizes Industry Trend

By G. J. McManus—Pittsburgh Regional Editor

**U. S. steel mills are putting millions into a new way to boost blast furnace efficiency.**

**The trick: Feed them a diet of carefully prepared ores.**

**Ore sintering, as done in this new Armco plant, is one of the best ways to enrich the feed.**

■ The recent start-up of Armco Steel's new sintering plant at Ashland, Ky., spotlights what is probably the most important expansion item in the current steel picture.

Sintering is the magic word for steelmakers today. Armco's new installation is one of 26 major sinter-

ing plants recently completed or coming up soon. Its 2400-ton daily capacity is part of the industry-wide addition of 20 million annual tons for this year and next.

Coming on top of 13 million tons added in the four years ending last December, the current boost will give U. S. mills total sintering capacity of 64 million tons a year.

**Will Enrich Diet**—That will be enough to put the nation's blast furnaces on a diet of 50 pct sinter at full capacity. Along with coarse ore and taconite pellets, it will be enough to give most furnaces fully beneficiated charges.

The net result, say blast furnace men, will be to hike iron making

potential by a cool 20 pct. And this figure may head up toward 30 pct as mills go in for more sintering.

This gain will cost the steel industry something like \$300 million, possibly more. But the same tonnage gain from new blast furnaces would cost about twice as much. A relatively small (1600 tons) sintering line sells for about \$5 million, around 10 pct of the price of a new blast furnace with coke ovens.

Figuring a 20 pct increase in iron output with sintering, blast furnace capacity would cost \$10 million for the same number of tons.

**Fines Affect Cost**—The cost contrast might be less dramatic for a mill whose ore runs low in fines.



Some ores contain only 40 pct fines; foreign ores may range up to 80 pct.

The higher the percentage of fines in a blast furnace charge, the less efficient the process tends to be. The tiny particles are blown out of the furnace stack, and they work against efficient mixing of reducing gases.

Sintering avoids these problems by fusing fines into clinker-like chunks. The Armco setup screens the ore and directs all pieces under  $\frac{3}{8}$  in. to the sinter plant where fines are mixed with reclaimed particles and coke breeze.

**Sintered on Grate**—A balling drum forms the mixture into loose pellets. These are fed, to a maximum depth of 13½ in., onto a traveling grate which moves first through a furnace and then down an open line. The top layer of coke ignites in the furnace. Air is sucked through the sinter mix along the line to cause a downward burning action.

By the end of the 97-ft line, the mixture is fused into a solid sinter cake. This is crushed to size, screened and cooled. Undersize particles are recycled; they serve as a protective layer for the grate bar.

The Dravo-Lurgi sinter machine at Ashland uses 85 cast iron pallets to carry the sinter mix through the ignition and burning cycles. There are 15 wind boxes, three separate dust collector systems and a roll-type feed system.

**Will Reclaim Waste**—The plant can handle 876,000 tons of ore a year and will be fed a high tonnage of Labrador material. It will also be used to reclaim a 360,000-ton stockpile of flue dust and sludge, according to J. M. Lobaugh, works manager for Armco at Ashland. In salvaging this material, the \$5.5-million plant will pay for itself to a large extent.

By mixing sintered ore with taconite pellets and coarse lumps, Ashland's three blast furnaces will be getting fully beneficiated charges.

Armco isn't specifying the gains it expects from sintering. But figures from abroad and early results

## Mills Add 26 New Sintering Plants

MILL	LOCATION	NO.	TONS/DAY	COMPLETION	BUILDER
U. S. Steel	Fairless	1	4000	1956	McKee
	Pittsburgh	3	5000 ea.	1958	Dravo
	Gary	3	5000 ea.	1958	Dravo
	Youngstown	1	5000	1958	McDowell
	South Works	1	5000	1958	McDowell
Bethlehem	Sparrows Pt.	6	2000 ea.	1952-57	Bethlehem
Weirton	Weirton	1	6000	1958	Koppers
	Weirton	1	2500	1955	Koppers
Jones & Laughlin	Cleveland	1	2500	1957	McKee
	Aliquippa	1	6000	1960	
Armco	Ashland	1	2400	1958	Dravo
	Houston	1	1400	1957	Koppers
Great Lakes	Detroit	1	7000	1958	Koppers
Inland	Ind. Harbor	1	4000	1959	McDowell
Youngstown Sheet & Tube	Ind. Harbor	1	4000	1959	McKee
McLouth	Trenton	1	2000	1958	Dravo
Granite City	Granite City	1	2000	1958	McKee

from U. S. tests lead blast furnace experts to predict 20 pct gains in iron output with confidence.

**Still More Savings**—With sintered ore, use of coke and other furnace materials is also expected to drop. In the past 10 years, ore beneficiation has cut material consumption per ton of pig iron from 3.32 tons in 1948 to 2.99 tons last year.

Last year, for example, it took 1684 lb of coke to make a ton of pig iron. With more sintered material going into charges, furnace experts see 1150 lb of coke as the ultimate goal.

Labor and other operating costs also figure to drop in line with material consumption. Gaged by the present cost above that of metallics, these savings might range from 50 cents to \$1.60 per ton. Operating costs for a sinter plant are put at about \$1 per ton.

**Future Outlook**—Looking ahead, there seems to be a question as to how far steelmakers will go with sintering. A short time ago it looked as if the current wave of projects would just about take care of current needs.

But changes in thinking could trigger a rash of new projects. For example, at one time it was thought that sintering benefits tapered off when the agglomerated portion of the charge reached 50 pct. Currently, however, mills find it pays them to use 65 and 75 pct sinter in charges.

There is also the question of limestone additions. European practice calls for the ore to be fully prefluxed in sintering. Calcining on the sintering line is more efficient than doing it in the blast furnace. In the prefluxing technique the formation of CO<sub>2</sub> instead of CO liberates about three times as much heat. Then, too, coke breeze costs only half as much as blast furnace coke.

According to one authority, prefluxing can increase pig iron output by an extra 10 pct. A number of mills are playing with the idea, and one producer is now testing a fully prefluxed sinter product.

"The trend now is to do as much as you can with your ore outside the blast furnace," says one expert.

# Titanium Wins New Acclaim In Tough Ordnance Trials

By J. G. Stefanich—Materials Branch, Research & Development,  
Ordnance Tank-Automotive Command, Detroit Arsenal

**There are all the makings of a new titanium upsurge in the field of military vehicles.**

**Despite waning enthusiasm in some quarters, it's still the bright hope for slashing weight of structural elements.**

**Ordnance is fast finding ways around the old drawbacks.**

■ Current disillusionment with titanium stems from many causes. However valid they seem, it's too early to dismiss this material. While it may not measure up fully to original predictions, titanium might prove very valuable for special uses.

We're looking at it for various parts of armored vehicles. We still feel that titanium and its alloys may help reduce gross weight without compromising design. As an example, it shows real promise for armorplate. But first, we must learn more about fabricating it.

Work along these lines is already making progress. The idea is to have improved fabrication methods ready for production when titanium output increases and it can compete costwise with other materials.

**Four Areas** — Current studies are mainly on welding, press forming, forging, and machining. Welding is limited to three processes: tungsten arc, metal arc with con-

sumable electrode, and tungsten arc with automatic wire feed. The metal arc process has been found best for the type of parts being made experimentally.

Parts produced and tested under the program include road wheels, suspension arms, tow bars, spindles, shafts, tank tracks and track shoe assemblies. Many of the titanium components were forged. Metals used include Ti-3Al-5Cr, Ti-4Al-4Mn, Ti-2.7Cr-1.5Fe, and commercially unalloyed titanium.

Forging presents no major problems. Dies used for forging steel make larger titanium parts because of the different coefficient of expansion. Standard ovens are used



**GOOD POSSIBILITIES:** Titanium test parts for armored vehicles include support arms, spindles

shrunk-fit into arms and brackets, and final drive shafts. As a whole, they made a good showing in field trials.

to bring billets to between 1800° and 1850°F.

**Contaminates Easily** — Heating above 1850°F is to be avoided because of surface embrittlement. This is due to rapid contamination by oxygen and nitrogen from the atmosphere. Besides, heating above 1850°F causes excessive grain growth which results in poor ductility; and grain structure can't be refined later by heat treatment.

Road wheels were made by welding formed pieces. The wheel rim is  $\frac{3}{8}$ -in. plate of unalloyed commercial titanium. The disk is  $\frac{1}{2}$ -in. plate. Forming had to be done at 900° to 1000°F.

Rim, disk and reinforcing ring of commercially unalloyed titanium were welded by the metal arc, inert gas-shielded process. Filler wire was 7 pct Mn-Ti alloy. The rubber tire tread was bonded in the usual way.

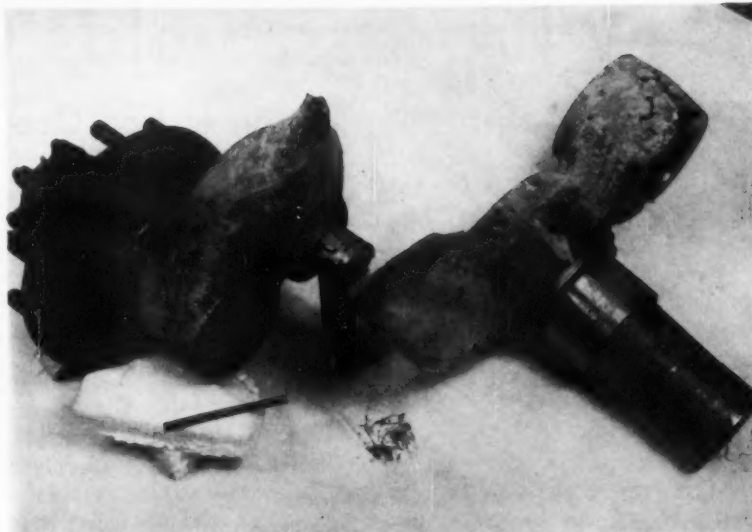
Standard lab tests checked bonding, weld soundness and life expectancy. One drum separation test showed tire separation and twelve transverse cracks in weld deposits. Because the failure was not catastrophic, the wheel was salvaged for subsequent vehicle test.

**Machined Parts** — Road wheel spindles, wheel arm spindles and shackle pins were machined from titanium rounds having 2.7 pct Cr and 1.5 pct Fe. Two heavy-duty tow bars of commercially unalloyed titanium were fabricated by welding.

The main cause of poor machinability in titanium was found to be excessive carbon. By observing known precautions, the parts were machined without too much trouble.

Assembly methods included shrink fits of spindles into standard steel arms and titanium arms. None of these assemblies failed by relaxation of the shrunk-fit joints. In fact, spindles mounted in both steel and titanium road wheel arms and cast steel support roller brackets performed well in the field. Test distances for five spindles were over 6000 miles.

**Rough Trials**—The titanium tow



**EARLY FAILURE:** Poor impact strength due to high carbon content and skin contamination during forging caused front wheel arm to fail.

bars held up well in towing and recovery operations in rough terrain. Vehicles towed weighed up to 80,000 lb, severely stressing weldments.

Ten intermediate and two front spring arms made of 4Mn-4Al titanium alloy were also service-tested. Eight intermediate arms and the two spring arms failed at relatively low mileages. The other two arms completed 4000 miles of testing.

Two final drive shafts of 4Mn-4Al titanium alloy came through over 6000 miles of rough tests with flying colors. These tests in armored vehicles included steep hills, deep mud, sharp turns and full braking, with two complete pivot turns every 4 miles of the first 2000 miles.

**Poor Metal**—A major factor in failures undoubtedly was the vintage of titanium used. The metal was obtained from early heats which proved to be contaminated and had low impact strength. For instance, the 3Al-5Cr titanium alloy was induction-melted in a carbon crucible. This melting practice has since been discontinued because of carbon contamination.

However, results of the service tests were very promising despite

the inferior metal. Many of the parts performed without failure. V-notch Charpy data and low reduction of area values indicate that the titanium arms were brittle and had little ductility. These factors added to early arm failures.

Two forged final drive shafts, which were machined all over, were fabricated from the same metal as the failed arms. They were successful in all service tests.

Completely machined titanium spindles and shafts performed well in all service tests. They were fabricated from different metal compositions; some had low impact strength, poor elongation and reduction values.

**The Real Cause** — It appears, then, that factors other than metal strength and composition were the main cause of suspension arm failures. We believe we've definitely pinned this down to skin impurities of forged parts, since completely machined pieces proved successful in all cases. Failures occurred only in parts with as-forged surfaces.

The obvious answer is to eliminate skin impurities by machining parts that can be contaminated in processes such as forging.

# New Process Yields Quality Pig

## Small-Scale Direct Reduction of Iron Ore

By Albert de Sy—Head of Metallurgical Dept., University of Ghent, Belgium

**Not intended for tonnage production, this new process may set the pattern for future direct reduction processes. Its unusual furnace design turns out a quality product.**

■ A new direct reduction process for iron ore uses carbon as the reducing element and electricity as the energy source. On a pilot plant

scale, it produces both a high grade of pig iron and a quality carbon tool steel.

Perhaps its main significance is that it successfully adopts an approach that future direct reduction processes are likely to follow.

Developed at the University of Ghent, Belgium, the new process is intended for the reduction of iron-rich ores with an iron content of at least 65 pct. Except in special

cases, it is not a tonnage steel process.

**Likely Applications**—Still, it is ideal for the small-scale production of pig iron, high quality virgin iron as base material for high quality alloy steels, and special pig iron for the production of ferritic nodular iron.

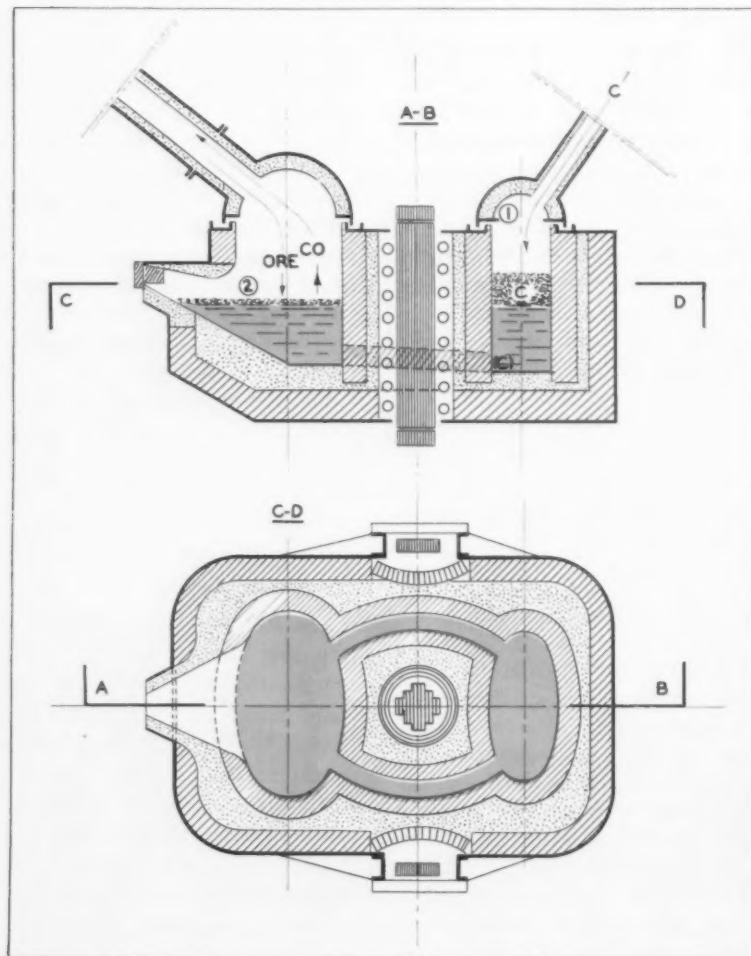
The new process operates in a double-hearth, network frequency inductance furnace (Fig. 1). Iron ore is at least partially reduced by carbon dissolved in the liquid iron bath. The supply of carbon must be continuously replaced.

**How It Works**—Carbon additions—and eventually desulphurizing additions—are made to hearth No. 1. The carbon dissolves in the liquid iron. Owing to the high diffusion rate (at 2700° to 2900°F) and intense electro-magnetic stirring of the metal, dissolved carbon migrates almost immediately to hearth No. 2. Here it is oxidized by the iron ore additions which melt at the surface of the metal bath and form a liquid, FeO-rich slag.

The principle of the new process is linked to this special type of double-hearth furnace. Although it contains a single metal bath, one section operates under strongly reducing conditions. A second section operates under highly oxidizing conditions.

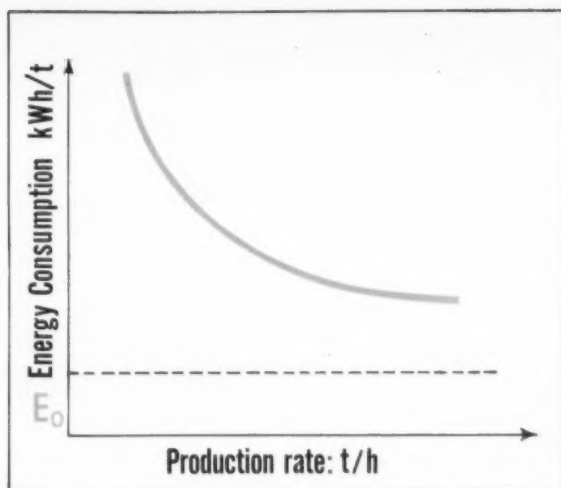
**Efficient Heating**—Induction heating results in a highly efficient calorific current yield because the heat is generated entirely in the metal bath. Heat loss through the surfaces of the metal bath in either hearth is partly absorbed by the charges of carbon and iron ore.

The main advantage of induction heating stems from an electro-magnetic stirring action that can be



**FIG. 1:** New double-hearth furnace is heated by induction. Direct reduction taken place in hearth No. 1.





**FIG. 2:** Energy consumption per ton of iron produced greatly depends on production rate. Curve shows relationship between the two factors.

controlled. This stirring action determines the rate of carburization in hearth No. 1 and of decarburization (or ore reduction) in hearth No. 2.

Carburization of a molten iron bath in a conventional arc furnace by means of a surface carbon layer is slow and unreliable. This condition results from the burning of an unknown amount of carbon in the oxidizing atmosphere. With the new process, carburization in hearth No. 1 is very fast. Still, it is not the limiting speed factor for the entire process. These results were determined on a pilot-plant basis with a 1-ton furnace having a 150 kva rating.

**New Modifications**—In the original furnace, both hearths had equal surface area. This resulted in an unnecessarily high carburization rate in hearth No. 1. In the revised version (Fig. 1) hearth No. 1 was reduced while hearth No. 2 was increased proportionately.

Initially, the carbon addition was simply floated on top of the molten metal. With the modified furnace design, the carbon will be immersed in the molten bath. No carbon should be lost due to burning in the furnace atmosphere.

Operating with a nearly saturated iron-carbon bath (4 to 5 pct C) at 2740° to 2820°F and an FeO-rich

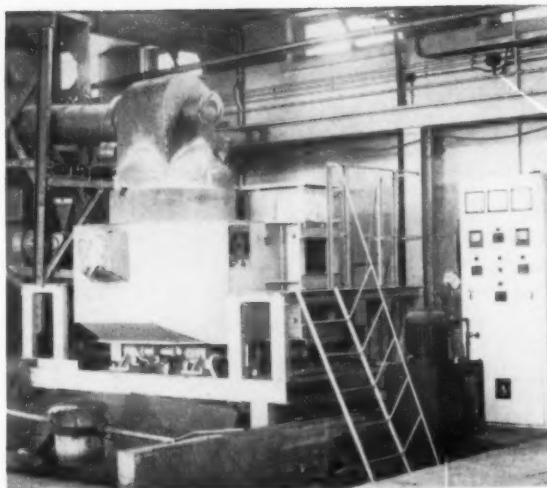
slag of good fluidity, electro-magnetic stirring forms an emulsion of metal and slag. Contact surface between the two liquid phases is increased significantly. The emulsion serves to: (1) maintain a maximum level of dissolved oxygen, (2) stimulate the speed of reaction, and (3) accelerate the reaction between the oxygen of the slag and carbon dissolved in the metal bath.

**Production Counts**—Heat losses must be made up to maintain a given bath temperature. This means that energy consumption per ton of iron produced greatly depends on the production rate. The relationship is shown schematically in Fig. 2. The electrical energy input just sufficient to maintain the

temperature of the metal bath is represented by  $E_0$ .

In view of the factors influencing the production rate, there should be no problem in maintaining a carbon level of about 4 pct at bath temperatures of 2740° to 2820°F or even up to 3100°F. Stirring action is a critical factor. This problem was solved by the manufacturer of the 1-ton, pilot furnace—Forni Elettrici A. Tagliaferri, Milan, Italy.

**Uses Rich Ores**—The viscosity of the FeO-slag depends on its temperature and composition. Composition, in turn, depends on the type of iron ore. The new process is suitable for rich ores only. Although an exact lower limit of iron



**NEW FURNACE:** Model was built for pilot plant tests. Its capacity is 1 ton with a power rating of 150 kva. Only rich ores can be processed.

### Energy Consumption Per Ton of Pig Iron

The following values apply to a 1-ton, 150 kva pilot furnace at 2740° to 2820°F with a carbon level of 3 to 4 pct:

- 1) Cold ore ( $\text{Fe}_2\text{O}_3$ ) charge: 1830 kwh/ton  
Experimental results: 1810–1885 kwh/ton
- 2) Preheated ore charge (1840°–2020°F), pre-reduced to FeO: 1000 kwh/ton  
Experimental results not available.
- 3) Preheated ore charge (1840°–2020°F), pre-reduced 60–70 pct: 700 kwh/ton  
Experimental results not available.

content has not been determined, 65 pct iron content is offered as a safe figure. If the gangue is acid, basic additions are needed to protect the magnetite lining.

Does the rich ore requirement severely limit the usefulness or applicability of the process? It shouldn't in view of the availability of high grade South American ores, the hematites of India, Swedish magnetite ores, fines obtained through magnetic enrichment such as those used in the Hoeganaes or Wiberg sponge iron processes. Recently, Alan Wood Steel Co. reported producing iron powder with a 72 pct maximum iron content from very low grade ores.

**Not in Competition** — Since the new process lays no claim to being a tonnage steel process, it would not be expected to compete with blast furnace production. It is ideally suited for small scale production of pig iron and/or steel in

underdeveloped countries. In addition, it might be profitably applied to the production of high quality virgin iron or very low manganese pig intended for producing ferritic nodular iron.

The ideal reducing element for the process is carbon with a low ash and low sulphur content. Graphite and charcoal fit these requirements but are expensive, often scarce. In tests with the pilot furnace, both graphite and charcoal were used without any attempt to desulphurize. Pig iron and steel were produced with sulphur contents ranging from 0.011 to 0.012 pct.

**Other Plans** — In future tests, low ash anthracites will be tried. Without desulphurizing, it is expected that sulphur content will average about 0.2 pct.

By mixing the anthracites with dry lime, sulphur pick-up from the carbon source should be negligible.

Atmosphere in the carburizing hearth is highly reducing. Electromagnetic stirring can produce a good emulsion of carbon and lime in the molten metal. The combination should contribute to ideal desulphurizing conditions.

In early tests, iron ore was charged cold. Later, ore was preheated and partially pre-reduced. This procedure would normally be followed in industrial production in order to make use of the sensible and latent heat of the resulting carbon monoxide.

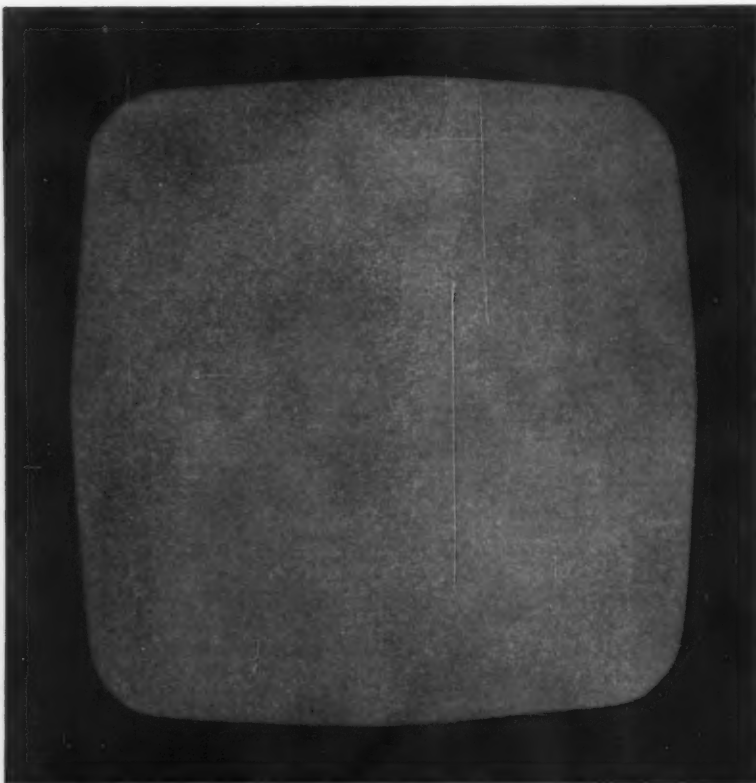
**Power Requirements** — To produce a ton of metal, the process requires about 800,000 k-cal. It produces about 2,135,000 k-cal. Thus recuperation is required in the form of preheating or even pre-reducing the ore. This will cut back greatly on the amount of process heat needed.

The 800,000 k-cal requirement is lowered to 470,000 k-cal if the ore is pre-reduced to FeO and charged at 1840° to 2020°F. At the same time, production is doubled and heat losses are cut proportionately. A 33 pct pre-reduction is involved in converting  $Fe_2O_3$  to FeO. This could be extended to 60-70 pct pre-reduction if desired.

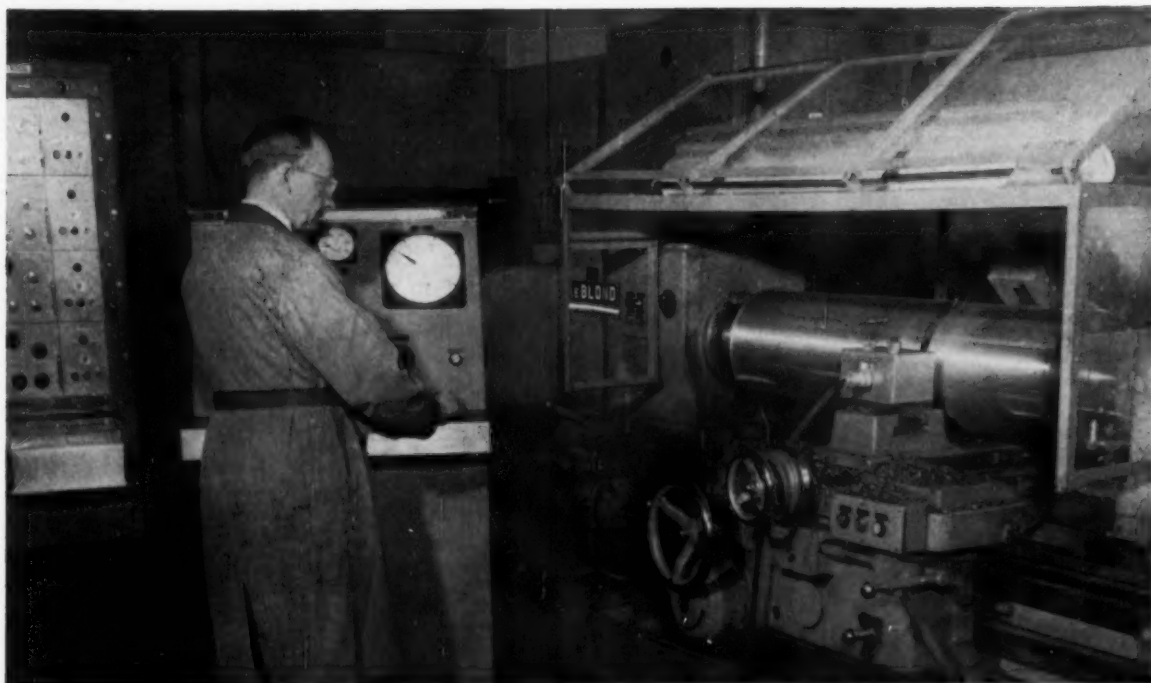
**High Quality** — Because process heat is independent of furnace capacity, relatively little efficiency can be gained by going to larger furnaces with capacities of 10 tons or more. Only heat losses are lowered by increasing furnace capacity. With a larger furnace, maximum savings in electrical energy consumption would be of the order of 10 pct.

In the test program, the pilot furnace was operated with cold Brazilian ITABIRA lump ore charged by hand. The ore contained about 69 pct Fe, 1 pct gangue, and low phosphorus and sulphur. Both pig iron (4 pct C, low Mn, and no Si) and carbon tool steel (0.8-1.0 pct C) were produced.

A 688-lb ingot was rolled to billets approximately 3 in. square. The quality of the steel was excellent as the macrograph shows.



**QUALITY:** Macrograph shows the excellent condition that was obtained in the billet. The portion shown was taken from the top section.



**TEST SETUP:** Metallurgical Products Dept. tests tool materials on this special 20-in. LeBlond lathe.

# Modern Cutting Tools Save Costs At High and Low Speeds

By **H. J. Siekmann**—Manager Machinability Lab.,  
Metallurgical Products Dept., General Electric Co., Detroit

**Do you shy away from using modern cutting tools of the ceramic type?**

**Afraid your machine tools won't run fast enough to get the most out of them?**

**Surprisingly, such tools often yield the biggest savings at speeds under 1000 sfpm.**

■ The push to reach higher machining speeds with new cutting tool materials is a logical one. It has a solid base in dollars-and-cents reasoning.

But what about the potential savings in using these new materials at low speeds, say 1000 sfpm or less? In many cases, low speeds are actually the most efficient and economical.

Your big question, if you're thinking of using a new cutting tool material, is simply this: How much money will it save? The easiest way to get the answer is to figure the tool life that yields the lowest machining cost per piece. The standard formula is:

$$T_c = \left( \frac{1}{n} - 1 \right) \left( \frac{t}{M} + TCT \right),$$

where:

$T_c$  = tool life for minimum machining cost per piece

$n$  = slope of the tool lifeline

$t$  = total cost of the cutting edge, including such costs as regrinding and depreciation of brazed tools or mechanical tool holders

$M$  = machining labor and overhead rate

$TCT$  = tool changing time.

**Watch All Factors**—It's clear that a lower cost per cutting edge ( $t$ ) permits minimum-cost machining at higher cutting speeds. So does a reduction in tool changing time ( $TCT$ ). And today, especially, anything that cuts the labor and over-

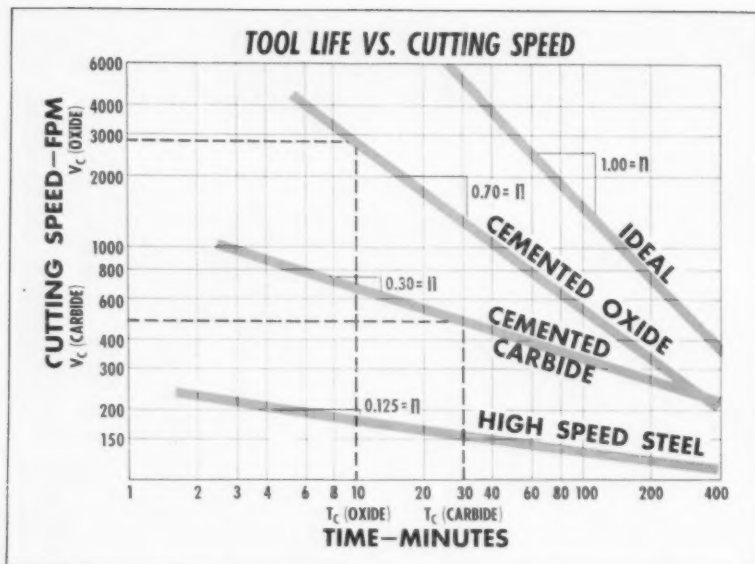


FIG. 1: Steepness of slope is the controlling factor in minimum-cost tool life. Steeper slopes mean better high-speed performance.

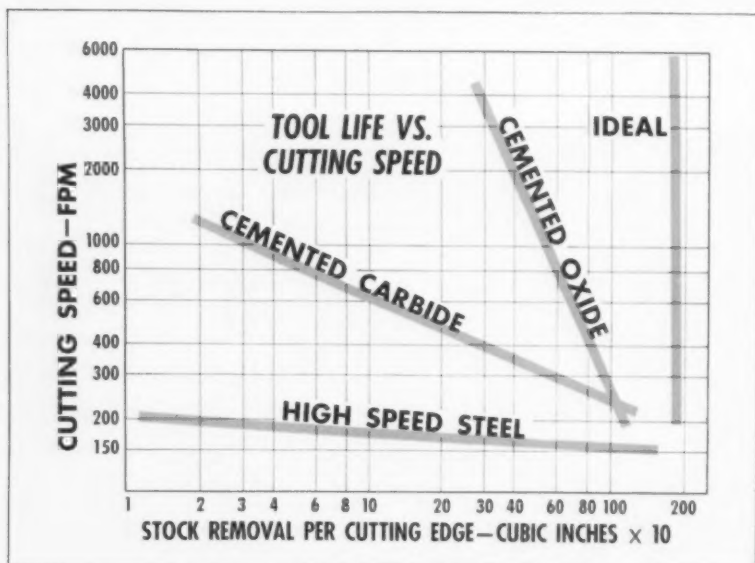


FIG. 2: Modern cutting tool materials approach the ideal concept of a constant amount of stock removal per cutting edge at any speed.

head rate (M) will bring costs down still more dramatically.

Yet, no matter what happens to these cost factors, the controlling influence on minimum-cost tool life is the value of "n." Check this in Fig. 1. Note the moderate difference (3 to 1) in minimum-cost tool life ( $T_c$ ) between cemented carbide and General Electric's new cemented

oxide material. But because of the different "n" values for these products, the difference between their minimum-cost cutting speeds ( $V_c$ ) is a much greater 6 to 1.

A steeper slope (greater "n" value) indicates a tool material will perform better than others at high speeds. The reason: less sensitivity to high temperatures at the tool-

chip interface. In other words, the material will resist softening and wear at fast cutting rates.

**Seek Ideal Material**—The ideal tool material would not be affected at all by high-speed, high-temperature cutting; it would have the same wear characteristics at all cutting speeds. This would give it a 45° slope ("n" = 1.00) as shown in Fig. 1. Substituted in the tool-life formula, an "n" value of 1.00 would produce a minimum-cost tool life equal to zero. In turn, this would call for an infinitely high cutting speed.

Such an answer is logical (though improbable) since the ideal tool material would remove the same volume of metal for each cutting edge regardless of cutting speed. (This effect shows up more clearly in Fig. 2 where tool lifelines are plotted in terms of cutting speed vs. cubic inches of stock removal per cutting edge. The ideal material has a vertical lifeline indicating a constant amount of stock removal per cutting edge at any speed).

With the ideal material, therefore, tool cost per piece would also be constant at all cutting speeds. But manpower cost per piece would be less because more pieces would be made in less time. Theoretically, optimum machining conditions would then be limited only by the highest spindle speed of the machine tool.

**Devices Needed Now**—To follow the ideal tool theory through, the time for changing such tools and loading and unloading workpieces should also be cut to zero. This is impossible, but it does point out the pressing need for (1) magazine loaded tool holders to change cutting edges quickly, and (2) faster automatic devices for loading and unloading machines.

Actually, these improvements are needed now just to keep up with the high cutting-speed potential of carbide tools. The need will grow still more serious as new tool materials edge toward the ideal "n"



value and cutting speeds reach new highs.

But what about the value of low speed machining—using cemented oxides or any other new tool material at 1000 sfpm or less? The tool lifeline in Fig. 3 shows that cemented oxide, for example, cuts in a normal way down to at least 300 sfpm. At this low speed, tool life in the cut is well over 200 minutes.

**Low-Speed Forces** — Moreover, it appears the line would continue straight down to the speed where edge buildup and high cutting forces would chip or break the cutting edge. Fig. 4 shows what happens at the cutting edge of a cemented oxide tool (0-30) and a carbide tool (350) at speeds from 0 to 180 sfpm. As speed decreases, all three force components increase.

A fairly sharp dip occurs in the cemented oxide curves at about 20 sfpm. This indicates the possibility of the built-up edge increasing the effective rake angle. Instability of force measurements was noted from about 40 sfpm down to 10-15 sfpm.

This instability and the force-lowering effect of the built-up edge occur at a lower cutting speed with the cemented oxide tool than with the carbide tool. These facts seem to support the claim that cemented oxides resist chip welding.

Practically speaking, there seems to be little difference between the oxides and the carbides; high forces at low speeds would affect the relatively weak cemented oxides much more than they would a roughing grade of carbide.

**Use Average Machines** — Still, there seems to be no basic reason why cemented oxides cannot be used in the moderately-low speed range. Actually, "high speed machining" is only a relative term; in cutting fully hardened (60-65 R<sub>c</sub>) alloy steels it would mean a speed of 600 to 700 sfpm, perhaps. This is certainly within the range of machine tools used in average shops.

These lower spindle speeds are

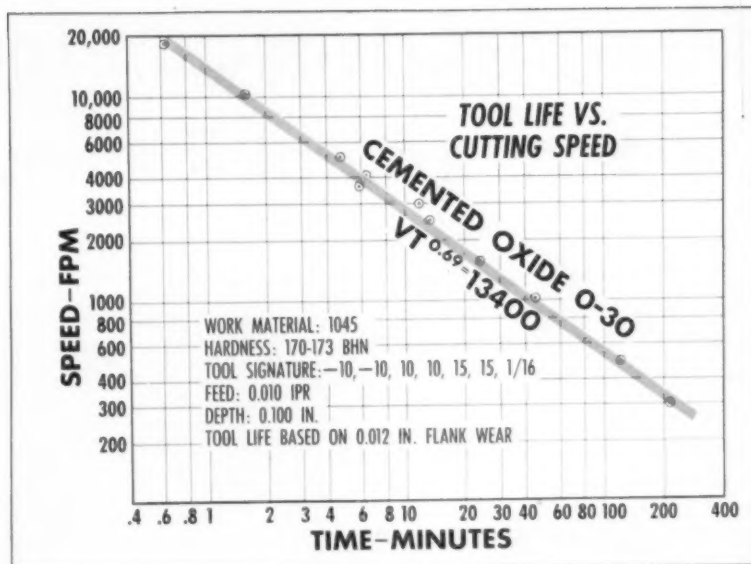


FIG. 3: Based on a standard amount of flank wear, cemented oxide tools show a straight lifeline over a broad range of cutting speeds.

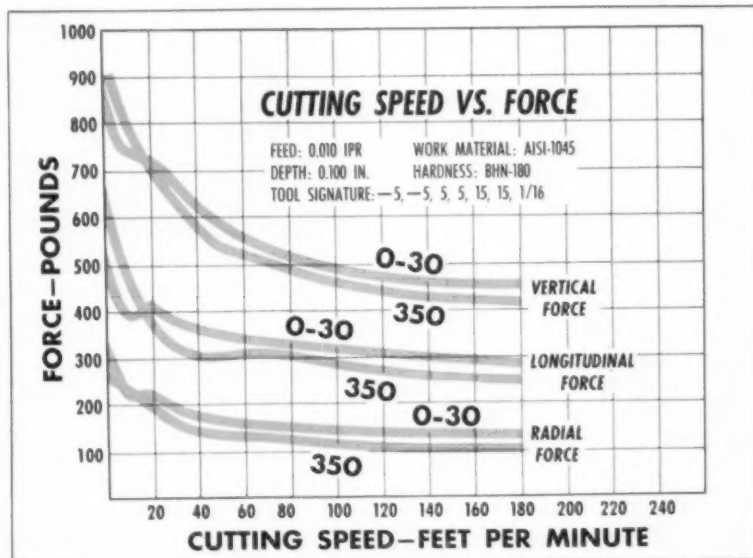


FIG. 4: At very low speeds, forces build up rapidly on the cutting edges of both cemented oxide (0-30) and carbide tools (350).

not only adequate as minimum-cost cutting speeds for cemented oxides; they also call for very little horsepower in making finishing cuts on hard alloys. Again, there is ample horsepower available on average equipment.

Thus it is not only possible to use cemented oxides at low speeds, but on some materials now being

machined in ever-growing volume, low speeds are the most efficient and economical.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

# Electro-Chemical Process Speeds Metal Removal

Simple almost in the extreme, this new chipless machining process is fast, accurate, and gives good finishes.

It promises to be a real boon for dies and other contoured work, large or small.

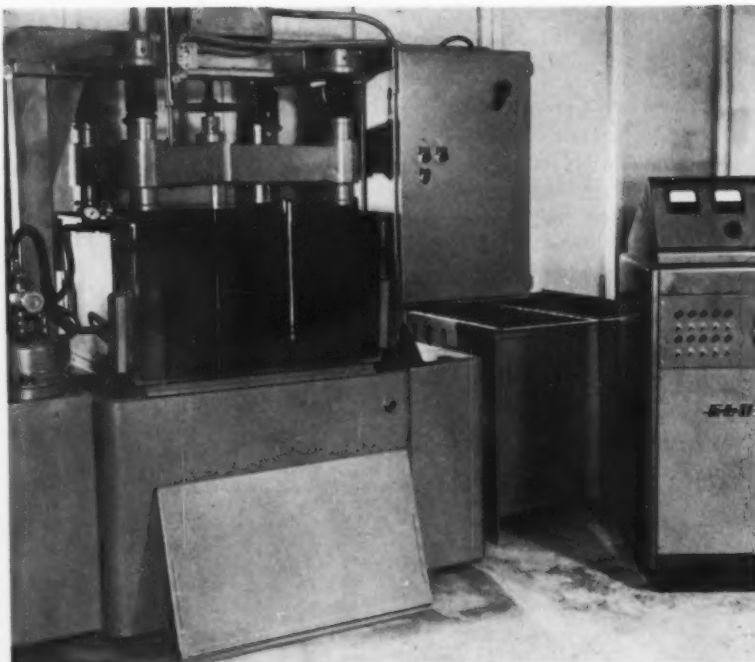
■ Latest entry in the chipless metal removal field is a new process called Electro-Chemical Machining—for short, ECM.

Reduced to essentials the process is simply one of electrolysis. It uses sodium chloride—common table salt—as the medium. Developed by Elox Corp., Royal Oak, Mich., ECM has several advantages over the firm's older method, electrical discharge machining. For one thing, the electrode or male die remains virtually untouched, whereas it's usually eroded away in the discharge process. Also, metal removal rates are much faster.

**Gap Controls Accuracy**—Briefly, this is how the new process works: With both electrode and work—piece submerged in the saline solution, metal is removed by electrochemical action. The action is controlled by a highly sensitive servo feed system that automatically advances the electrode into the workpiece as machining progresses.

Currents that can be used with ECM are unlimited. The gap between electrode and workpiece controls accuracy of the finished product; it has a low limit of 0.015 in. at the present time.

**Fast Worker** — Metal removal rates depend on the amount of current used. Typical rate using a 5000-amp power supply rating would be 30 cu in. per hour with a minimum electrode area of 100 sq in. A 50,000-amp power supply



**PROTOTYPE UNIT:** Electrode mounts above work, is precisely fed by servo system. Worktable is watertight to contain saline solution.

rating removes 300 cu in. per hour with a minimum electrode area of 1000 sq in.

Surface finish at higher amperages will be less than 50 microinches rms; lower amperages will produce less than 25 microinches rms. Test work shows tolerance of 0.003 in. can be expected.

The machine itself is a four-post type, resembling a small press. The upper platen holds a male pattern of the cavity you want to produce in the workpiece. The worktable holds the part blank, and is watertight to contain the electrolytic solution.

Electrodes can be made of any conductive material such as lead, tin, zinc, or solder. Even sprayed or plated electrodes will do in many applications.

The machines are safe and simple to use. Little operator training is needed.

**Keen Interest** — Although Elox has been working on the process for a year or more, the first machine was demonstrated only on August 15th. It's understood that automotive people are ready to snap up the first machines for tool and die work, as fast as they become available. ECM could slash costly benchwork time needed for barbering and hand finishing auto body dies.

Equipment cost is expected to be competitive with regular machine tools. Because of its simplicity, ECM equipment will likely cost less than some of the more complex tracer milling machines.

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Power Saw Model C-58 cutting 3/4" diameter AISI 1015. Tool cost \$1.54 per 100 cuts.

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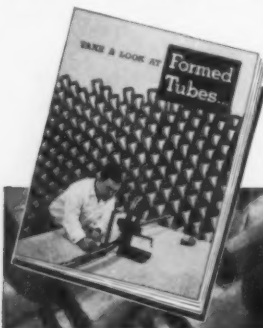
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The first machine tool on which numerical control is offered as standard equipment is the subject of a 12-page catalog. Numerical dials or punched cards control all ma-

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Load ratings and dimensions of more than 175 index tables are shown with dial sizes from 10 to 120 in. and rated for speeds up to 30,000 indexes an hour. (Ferguson Machine Corp. of Indiana.)

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sions are given in a catalog. (Hanna Engineering Works.)

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A firm's new line of stainless steel wire is covered in a 20-page manual, including mechanical properties and corrosion data. (Stainless Steel Div., Jones & Laughlin Steel Corp.)

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An illustrated folder describes a wide range of storage equipment for the metalworking plant. (Jarke Mfg. Co.)

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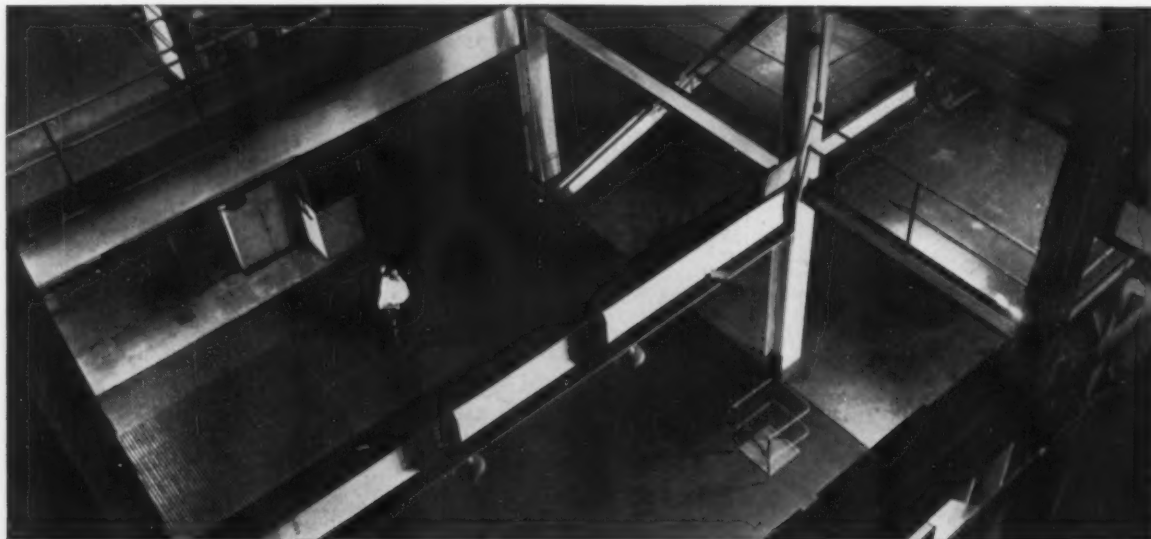


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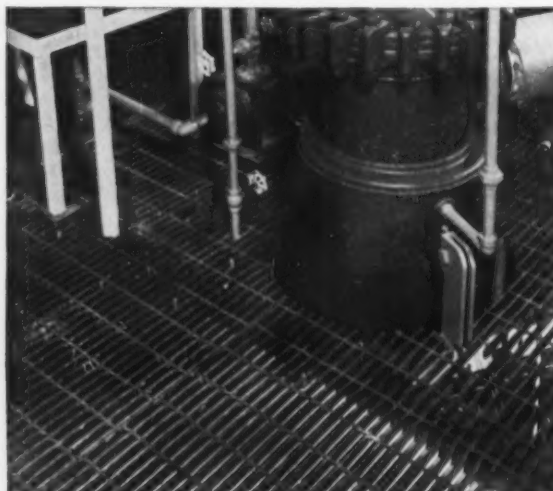
*designed for flexibility...Electroforged® for strength*  
**Blaw-Knox Grating fits modern plant needs**



**More floor space . . .** Platforms, mezzanines and loading docks made of flexible Blaw-Knox Electroforged Steel Grating increase storage space, enlarge feeder areas. Easily installed, and easily adapted to changing layouts.



**Safer walking . . .** on *non-slip* floors, walkways and stairs, Blaw-Knox Electroforged Steel Grating provides rigid one-piece construction and features the twisted cross bar to make every step a safe step.



**Fits anywhere . . .** around pipes, beams and machinery to provide a neat, easy-to-maintain surface. There's nothing to wear, patch or catch dirt. And Blaw-Knox Grating admits more light and air for ideal working conditions.

*Write for Bulletin 2527 and see how Blaw-Knox Grating can be custom fabricated to meet your plant improvement specifications.*



## **BLAW-KNOX COMPANY**

*Equipment Division*  
*Department T, Pittsburgh 38, Pennsylvania*

## FREE LITERATURE

and high-temperature vacuum-melted alloys. (General Electric Co.)

For free copy circle No. 16 on postcard, p. 105

## Chipless Shaping

Moving metal, as opposed to removing it, is the subject of a four-page bulletin. It covers upset forging, stamping and a cold-forming process. (Commercial Shearing & Stamping Co.)

For free copy circle No. 17 on postcard, p. 105

## Hot Spray Process

A revised edition of a 28-page booklet explains the theory of the hot spray process and features case history photographs. (Spee-Flo Co.)

For free copy circle No. 18 on postcard, p. 105

## Cylindrical Grinders

Complete data and illustrations of a line of hydraulic cylindrical grinders is covered in a revised 20-page catalog. (Landis Tool Co.)

For free copy circle No. 19 on postcard, p. 105

## Motor-Generator Sets

Vertical high-frequency motor-generator sets are the subject of a new bulletin. Data on ratings and dimensions in addition to cutaway drawings are included. (General Electric Co.)

For free copy circle No. 20 on postcard, p. 105

## Proving Rings

Proving ring specifications and accessories are listed in a 4-page bulletin. (Morehouse Machine Co.)

For free copy circle No. 21 on postcard, p. 105

## Tapping Machines

A revised illustrated bulletin describes two units for automatic tapping of pipe and couplings. (Landis Machine Co.)

For free copy circle No. 22 on postcard, p. 105

## Temperature Controller

New brochure describes basic design of a temperature indicating controller. (Fenwal Inc.)

For free copy circle No. 23 on postcard, p. 105

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IN CONVEYING ...



IN VESSEL  
AND STACK LININGS ...



IN NEW CONSTRUCTION ...

• In numerous ways, in numerous industries, the GREFCO TRUE GUN-ALL is proving a revolutionary advance in pneumatic refractories application.

Here, at last, is a *true* all-purpose, wet mix refractory gun, handling a complete range of materials for *all* applications.

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- HIGH ALUMINA MIXES
- COMPLETE RANGE OF CASTABLES

Write for full information on the GREFCO TRUE GUN-ALL and gun mixes.

**GENERAL  
REFRACTORIES  
COMPANY**

Philadelphia 2, Pa.



# GENERAL REFRACTORIES

# CONTACT!

**NEW "CONTACT BRONZE" STRIP KEEPS  
FORMED CONTACT PARTS, YET COSTS**

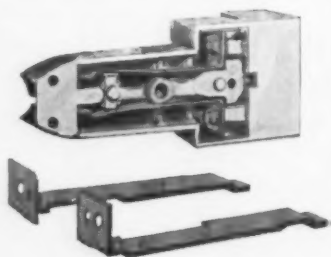
**THE SPRING IN  
UP TO 25% LESS!**



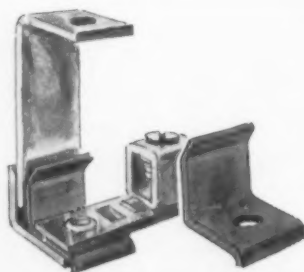
Manufacturers can now form intricate contact parts that cost less from Bridgeport's new "Contact Bronze" strip. High quality is maintained in this new, red color alloy strip by the addition of a minute quantity of phosphorus, which provides superior spring properties, even in hard-to-form parts.

Specially engineered for the electronics industry,

Bridgeport "Contact Bronze" Alloy 92 costs up to 25% less than metals previously used for this application. If you form or stamp shaped contact parts, learn how "Contact Bronze" can maintain quality at lower cost. Samples and a copy of the "Contact Bronze" data sheet are available from your nearest Bridgeport Sales Office. Call or write today!



These electrical terminals were originally made of phosphor bronze. Parts now are produced from Bridgeport "Contact Bronze" 92—at appreciable savings.



American Electric Switch Division, Clark Controller Co., Cleveland, Ohio, wanted a lower-cost material for pressure clips. Bridgeport "Contact Bronze" 92 met all specifications... good electrical conductivity to reduce heating, superior spring and mechanical properties—and all at lower cost.



A leading manufacturer of control switches needed these fuse clips with special mechanical and electrical properties. Bridgeport "Contact Bronze" 92 met the specifications—at lower cost.



**BRIDGEPORT BRASS**

Bridgeport Brass Company, Bridgeport 2, Conn. • Sales Offices in Principal Cities. • In Canada: Noranda Copper and Brass Limited, Montreal



## FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

### Barrel Finishing

A full line of equipment for precision barrel finishing is described in an eight-page bulletin. A new vibrator boosts operating speed 10 to 100 times faster than conventional tumbling barrels. (Lord Chemical Corp.)

For free copy circle No. 24 on postcard

### Titanium Machining

"Machining Recommendations for Titanium" is the title of a new eight-page brochure. Charts give suggested speeds, feeds and tool angles on turning, milling, drilling, tapping, grinding and reaming. (Mallory-Sharon Metals Corp.)

For free copy circle No. 25 on postcard

### Tractor Shovel

Twenty-five percent greater work capacity is the claim for a new industrial tractor shovel. It's illustrated in a 20-page two-color brochure, which describes the unit's fully automatic torque transmission. (The Yale & Towne Mfg. Co.)

For free copy circle No. 26 on postcard

### Die Casting Units

Offered in sizes from 650 to 2000 tons clamping capacity, a new line of toggle type die casting machines are covered in a bulletin. (Lake Erie Machinery Corp.)

For free copy circle No. 27 on postcard

### Insulation

A complete selection guide for insulating components is designed for personnel of maintenance departments, service shops and equip-

ment manufacturers. The six-page brochure describes step by step procedures for winding electric motors. (Dow Corning Corp.)

For free copy circle No. 28 on postcard

### Hydraulic Pumps

A new line of high-performance balanced-vane pumps operate at speeds up to 2000 rpm and pressures to 2000 psi. Six capacities are shown in new bulletin. Units were developed to meet the trend toward higher engine speeds and increased hydraulic circuit pressures on mobile equipment. (Vickers Inc.)

For free copy circle No. 29 on postcard

### Lubricants

Substantial economies in lubrication costs can be gained from dispersions of stabilized and sub-micronized molybdenum disulfide powder in greases and oils. Four-page folder describes advantages in reducing application costs, downtime, power requirements, and wear of equipment. (McGee Chemical Co., Inc.)

For free copy circle No. 30 on postcard

### Pneumatic Products

A line of pneumatic line filters, regulators and lubricators are covered in a new 20-page catalog. The booklet includes engineering and operational data. (Watts Regulator Co.)

For free copy circle No. 31 on postcard

### Sling Chains

With built-in factors of safety and strength, a line of sling chains, designed to solve sling chain problems in the field as well as in industry, is described in an eight-page bulletin. (American Chain & Cable Co., Inc.)

For free copy circle No. 32 on postcard

### Socket Cap Screws

Said to deliver up to 2½ times the load-carrying capacity of their conventional counterparts, a new design socket-head cap screw is described in a four-page bulletin. Increase in bearing area under the head permits greater loading and

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 No postage necessary if mailed in the United States

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## FREE LITERATURE

higher tightening torques. (Standard Pressed Steel Co.)

For free copy circle No. 33 on postcard

## How to Strip Paint

Four methods commonly used by leading industrial plants to remove paint are described in a booklet. Treatment of metals before repainting and prevention of rust on stripped surfaces in storage are also covered. (Oakite Products, Inc.)

For free copy circle No. 34 on postcard

## Hand Screw Machine

According to a new bulletin, a low-cost hand screw machine combines the time and cost-saving features of rapid chucking and multiple tooling with the advantages of low initial investment, low maintenance costs and power. (Delta Power Tool Div., Rockwell Mfg. Co.)

For free copy circle No. 35 on postcard

## Agitating Units

A new 16-page catalog introduces many items which have been added to an extensive line of laboratory and production agitators. (Eclipse Air Brush Co.)

For free copy circle No. 36 on postcard

## Buffing, Polishing

A four-page folder covers custom designed buffing and polishing machinery. (Devine Brothers Co.)

For free copy circle No. 37 on postcard

## Adhesives, Sealers

Official U. S. Government specifications for a wide variety of adhesives, coatings and sealers are covered in a new 23-page catalog. (Minnesota Mining & Mfg. Co.)

For free copy circle No. 38 on postcard

## Couplings

A new general catalog describes a company's line of quick-connect, quick-disconnect couplings. (Snap-Tite, Inc.)

For free copy circle No. 39 on postcard

## Cycloidal Blowers

Design and construction data in a new bulletin aids in application of a line of cycloidal blowers for vacuum service. (Roots-Connersville Blower)

For free copy circle No. 40 on postcard

## Tiering Truck

A new four-directional electric tiering truck transports long loads through a wide main aisle and moves sideways into narrow aisles. It's the subject of a new illustrated bulletin. (The Raymond Corp.)

For free copy circle No. 41 on postcard

## Screen Separators

Presenting operating, application and specification data, a new catalog covers a firm's 18-, 30- and 48-in. vibrating screen separators for use on all types of dry materials and separation of solids from liquids. (Southwestern Engineering Co.)

For free copy circle No. 42 on postcard

## Variable Speed Units

Pre-engineered instrumentation packages are featured in a new brochure covering the operation and application of a firm's line of variable speed drive and pneumatic control systems. (U. S. Electrical Motors, Inc.)

For free copy circle No. 43 on postcard

## Cast Stainless

Manufacturing facilities and quality control procedures for producing a high-alloy commercial castings, valves and fittings is the subject of a new 16-page booklet. (Cooper Alloy Corp.)

For free copy circle No. 44 on postcard

## Pressure Controls

A wide variety of pressure-vacuum controls features general purpose, sensitive, extremely sensitive, dual switch differential, absolute and explosion proof units. Catalog contains over 190 standard types and models. (United Electric Controls Co.)

For free copy circle No. 45 on postcard



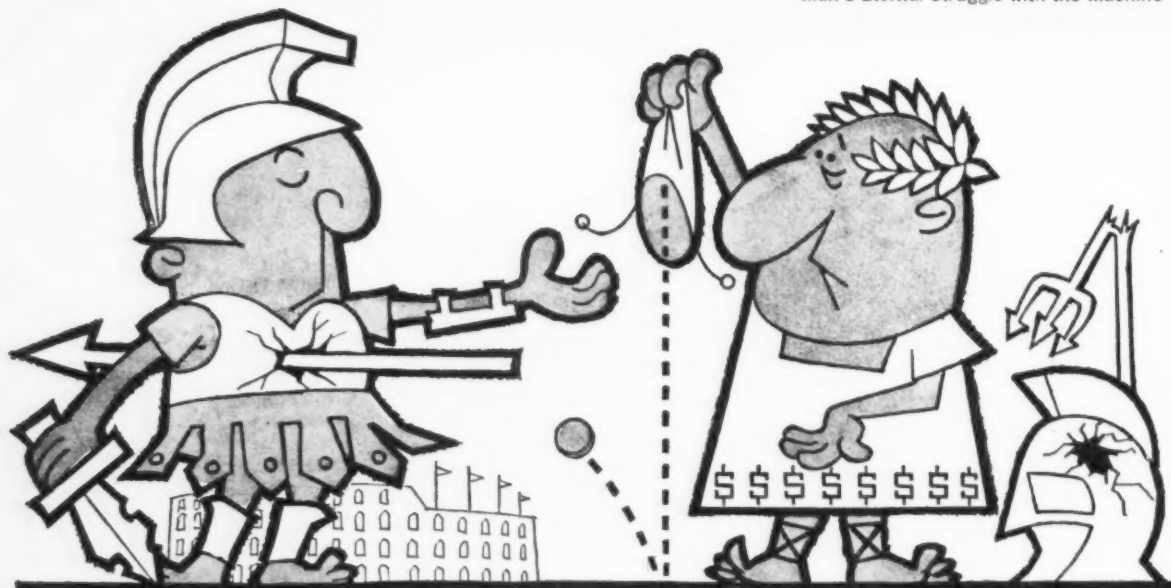
### The big boy sheds some weight...

...About three tons of it just came off in that lathe. For this "big boy" is a forty-ton plate mill roll—one of the largest made.

While no one here at Mack-Hemp was so blasé that he ignored this roll as it went through the shop, no one was overly impressed, either. Regardless of size, every roll that's poured here at Mack-Hemp receives the full measure of painstaking care—which is why *you get more tonnage from the rolls with the striped red wabblers.*



**MACKINTOSH-HEMPHILL • Division of E. W. BLISS COMPANY**  
Pittsburgh and Midland, Pa.



WITH ALL THE COSTS OF DOING BUSINESS RISING STEADILY, PROFIT IS MORE ELUSIVE THAN EVER!

## How long can the cost of "getting new equipment to work right" be buried in overhead?

No matter how attractive the original price of the equipment, it's false economy if the price tag *did not* itemize the extra money required to get it into production!

To your great responsibility for improving manufacturing processes has been added an *extra* concern for that old standby, catch-all type goodfellow called "overhead".

Overhead can no longer afford the labor and hard, cold cash-money often needed to make new equipment operate properly.

Sciaky knows about "overhead", too. That's why Sciaky resistance welding and production equipment is built to satisfy the requirements of *your* particular application. That's why Sciaky equipment is thoroughly tested and proved to do that particular job *before shipment*.

The result protects the profit your manufacturing operations can earn by (1) providing only the right equipment at the right price, (2) minimizing the lost time and cost of production try-out, and (3) minimizing rejects and costly re-working.

Why take less than the full advantage of consulting with a Sciaky Application Engineer the next time you are considering equipment. No obligation, of course.

A successful manufacturer of double-bowl kitchen sinks took that advantage. As a result, they replaced the previous high-reject, unprofitable method of fabrication with Sciaky resistance welding equipment. Within only ten days of installation, over 10,000 sink units were produced with less than a 1% scrap factor. Write for "Resistance Welding At Work", Volume 4-No. 6 for the details.



SCI AKY BROS., INC., 4923 W. 67th STREET, CHICAGO 38, ILLINOIS • PORTSMOUTH 7-5600



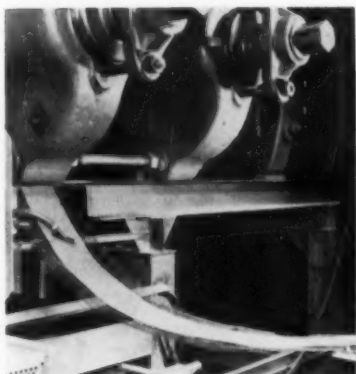
# Rolls Powder Strip

A pilot line proves that quality is the strong point in hot rolling strip from metal powder.

With quality problems solved commercial production will soon be a reality.

A test program brings out the fact that it's possible to produce hot-rolled strip from powder at savings of about 80 pct of conventional equipment and rolling costs. While most development work has been in copper, the system applies to many other metals. Experimental work on nickel shows promise.

In conjunction with Chemetals Corp., New York City and others, E. W. Bliss Co., Canton O., developed the process. The firm's own tests, tests run by a major producer



Green compact new method is uniform, square edged.

of copper products, and the findings of independent testing laboratories reveal these facts:

**Check on Properties** — Copper strip produced from powder has higher mechanical properties than

## Carlstrom



**METAL STAMPING**

With our engineering know-how and equipment, we can create and produce the exact stampings you need accurately, economically and on time.



Send your blueprints for our quotation.  
55 Fisher Street  
Westboro, Massachusetts

**CARLSTROM PRESSED METAL CO., INC.**

*Cut Costs*  
WITH  
**EXTERNALLY WRENCHED**  
**count-r-bor**  
**SCREW**

Faster and tighter wrenching in counterbored hole applications result when you use this new externally wrenched screw. Any socket wrench handle with standard 12-pt. socket may be used for assembly.

Samples, prices, complete information upon request. Write today—

**THE FERRY CAP & SET SCREW CO.**  
2157 Scranton Road • Cleveland 13, Ohio

**PLEASE  
NOTE  
OUR NEW  
ADDRESS**

STRAHS is bigger and better than ever. Spacious new warehouse, new advanced type equipment and enlarged trucking and shipping facilities mean more complete and even faster service to you. Remember STRAHS for aluminum . . . now, when and where you want it!

**IMMEDIATE DELIVERY  
ON MORE EXTENSIVE  
THAN EVER INVENTORIES OF:**

## ALUMINUM

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| • ANGLE           | • FOIL          | • PLATE             | • TOOL & JIG PLATE |
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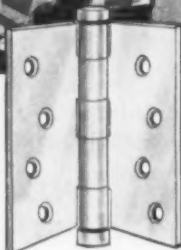
Warehouse Distributor of ALCOA® Aluminum Mill Products



# A \$1,395 Answer



**Clearing 22 ton Torc-Pac O.B.I. provides a low cost solution to manufacturing quality hinges.**



When you admire the smooth, quiet opening and closing of a heavy office building door you may be unknowingly praising the quality of ball bearing hinges produced by Lawrence Brothers, Inc., Sterling, Illinois.

Lawrence uses a new Clearing Torc-Pac O.B.I. for one of their operations. This is the machine equipped with air friction clutch and brake and a sealed-in-oil drive. Like the hinges, operation is smooth and quiet. Speeds go up to 225 SPM.

If you have need of an O.B.I. in the 22 to 45 ton range, take a tip from Lawrence, try a Clearing Torc-Pac. You'll find it's a lot of machine for the money. Speedy dependable operation at low cost. That's a Clearing Torc-Pac O.B.I.

Want more information? Send for free catalog today.



# CLEARING PRESSES



the way to efficient mass production

**CLEARING MACHINE CORPORATION** division of U.S. INDUSTRIES, INC. 6499 W. 65th Street—Chicago 38, Illinois / Hamilton Division, Hamilton, Ohio

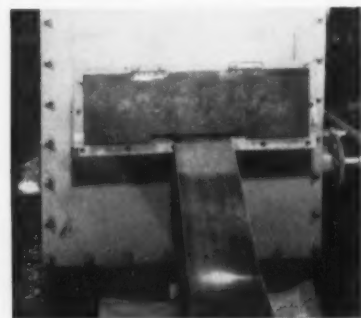
## TECHNICAL BRIEFS

electrolytic grade copper strip produced by conventional means. The oxygen content is substantially lower in the powder strip.

Production of this high-quality strip follows more than six years of research. Many production problems were solved during the course of the experimental program.

Special rolls and feed devices had to be developed before it was possible to produce green compact of uniform thickness and density with sound square edges. Further work had to be done in the fields of protective atmosphere, sintering time and sintering temperatures.

**Research Pays Off**—The end result of all this research is metal strip comparable or superior to conven-



**Atmosphere, sintering time and temperature are critical.**

tionally produced strip. The powder metal copper coils used in the tests were 0.040-in. gage, 6 in. wide, and 100 to 200 lb in weight.

Tensile tests show that strip produced from powder averages higher tensile strength for the same average elongation than does conventional grade.

In a second series of tests, two methods were used to determine

## Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 105. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

oxygen content: the  $H_2$  loss method and the vacuum fusion method. Low oxygen content of the powder strip, it is claimed, results from good atmospheric protection.

## Machining

**Tool-steel rolls place demand on individual**

Turning tool-steel rolls used for forming automotive trim molding is almost always a "one-time" job. Each roll is different from the last and as many as 20 stages are needed for a single molding.

For this specialized work, Dexter Roll Form Co., Detroit, finds the best approach is still the craftsmen-like "cut and try" method. It places



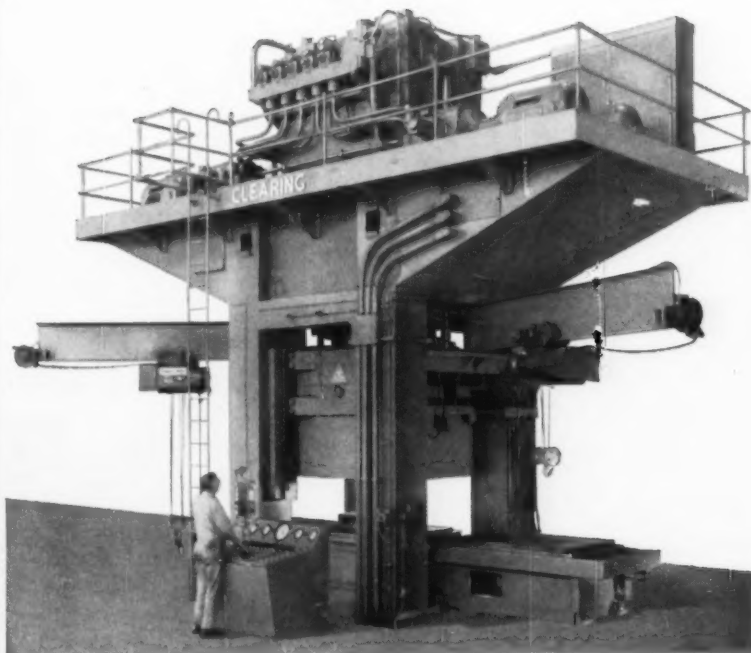
**Roll is checked against template with reflected light.**

maximum demand on the individual's skill. Evidence that the system works is a low reject rate with two shifts the rule rather than the exception for the past three years.

**Typical Pair**—Starting from solid cylinders of tool steel or bronze, hogging cuts are taken to approximate template shape. Then, using compound, cross slide and length travel, the rolls are turned to match the template. A final operation called "scraping" gets the exact shape.

A special steady rest with round nose and flat top mounts in the tool holder. A small cutting tool, moved against the work by hand, removes the final small quantities of metal. In checking dimension, the template

## Clearing Hydraulic Lowers Tooling Costs With Rubber Pad Forming



On this Clearing Rubber Pad Press, complex stainless, aluminum, or titanium parts can be formed in one operation—instead of the four or five operations required on conventional presses. In addition, dies for this method cost considerably less than conventional dies.

This Hydraulic Press has a rubber pad and container mounted on the slide. The pad acts as the female portion of the die. A male punch draw ring and draw ring pins are connected to a 3,150 ton cushion. This high tonnage cushion provides resistance to the main slide and in combination with the rubber pad makes complex forming possible. Relative pressure of cushion to main slide may be varied as necessary.

The press is designed with a rolling table so that blanks can be loaded outside the press on one group of dies while the press is working on another group. This same table can be used for quick die changing when using conventional tooling.

This is just one example of how Clearing can help you solve special production problems with hydraulic presses.

*For additional information write Clearing.*

# CLEARING PRESSES



the way to efficient mass production

**CLEARING MACHINE CORPORATION** division of **U.S. INDUSTRIES, INC.**

6499 W. 65th Street—Chicago 38, Illinois / Hamilton Division, Hamilton, Ohio

# DEMPSTER-DINOSAUR

## Handles GIANT Containers



### New Invention Cuts Costs in Scrap Collection, Materials Handling and Waste Disposal

Up to 40 cubic yards and over . . . up to 30,000 pound loads . . . plus the advantages and economies of detachable containers . . . that's the story behind the all-new DEMPSTER-DINOSAUR. The safe, fool-proof DINOSAUR is a masterpiece of simplicity . . . three simple, piston-type cylinders do the work . . . no cables to attach . . . no sheaves . . . no telescopic cylinders . . . maintenance and operational costs are slashed to the bone! It's the only machine of its type that picks up containers without the driver leaving his cab. The only one that can put containers on a dock.

### WRITE TODAY FOR COMPLETE INFORMATION

Mfd. By Dempster Brothers, Inc.



Dept. 1A-9 DEMPSTER BROTHERS, Knoxville 17, Tenn.

### TECHNICAL BRIEFS

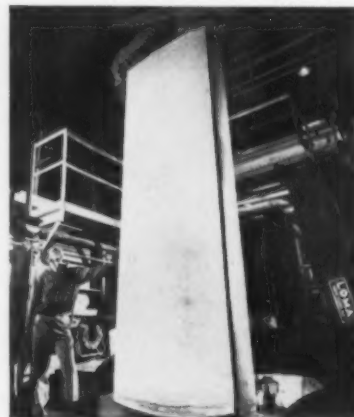
is held so that light shining against a white card can be seen between template and roll.

With the female roll turned first, the male roll is finish turned and checked in a surface plate with the female. The feeler gage used has the same thickness as the metal to be roll formed.

### Nonferrous

#### Continuous casting turns out giant aluminum alloy slabs

Six direct-chill casting stations are among the features of a recently completed integrated smelter rolling mill. Capable of casting at one time as many as four giant 10,-



New setup continuously casts four 5-ton slabs at one time.

000-lb slabs, the continuous casting equipment can produce aluminum alloy slabs up to 16 in. thick, 56 in. wide and 180 in. long.

All six casting stations were designed and built by Loma Machine Mfg. Co. for Kaiser Aluminum's plant at Ravenswood, W. Va. The new works will have an annual capacity of 170,000 tons of rolled products.

### Steelmaking

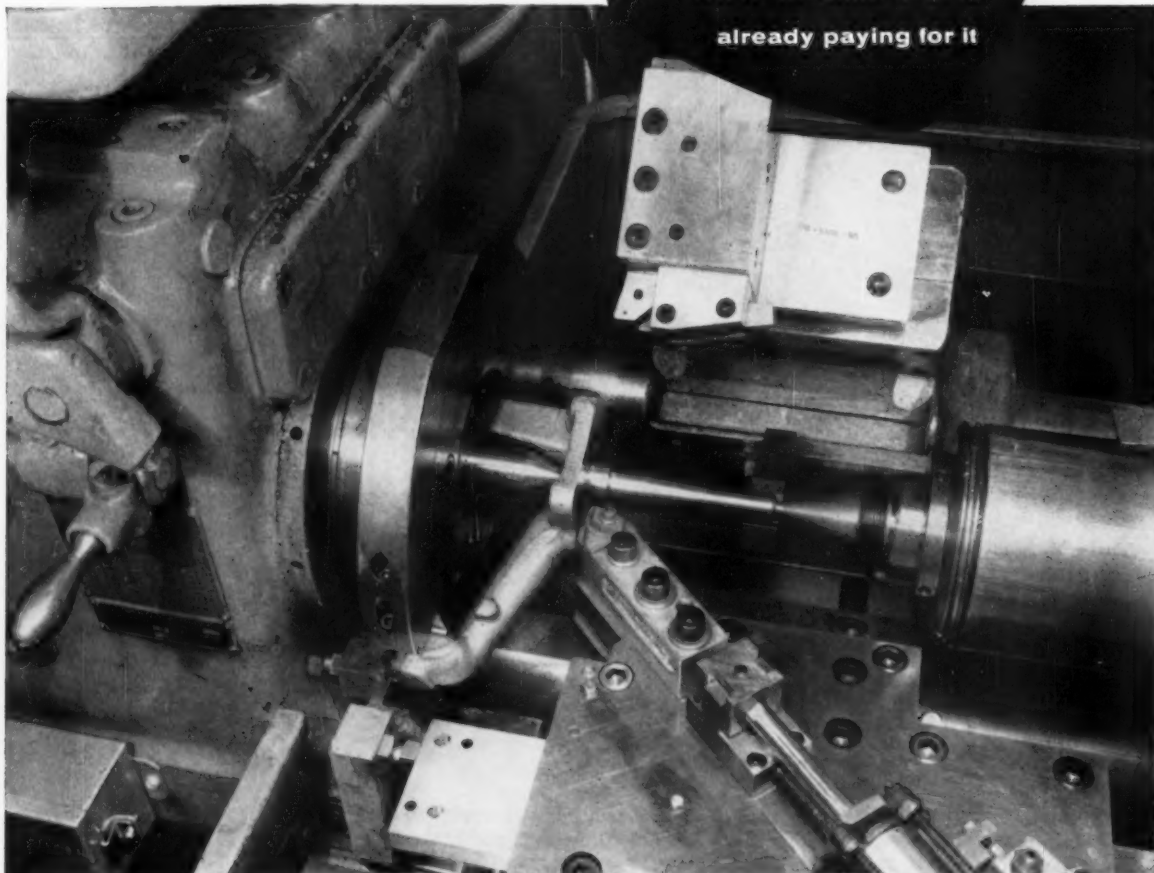
#### Huge cranes cope with furnace heats

Three 500-ton Goliaths, each encompassing nearly 6000 sq ft, have been put into operation at a large



## JONES & LAMSON MACHINE TOOLS

the man who needs  
a new machine tool is  
already paying for it



**Tracing on Standard Fay Automatics extends  
tool life 100% – consistently holds tolerances to .004"  
in one cut at high production**

Profile turning combined with back-arm machining is now available on the rugged, high production Fay Automatic Lathe. The tracing unit is relatively inexpensive and can be installed in the field, as well as on new machines at the factory.

Recent tests on steering knuckles showed that a single cut with the back arm faced the flange square within .001" at a surface speed of 585 F.P.M. The tracing unit, operating at 765 F.P.M., turned the entire contour of the stem up to the flange, while holding three diameters to .004". The complete machining

cycle was 40.5 seconds per piece.

Tool life, always an important cost factor on high production jobs, was excellent. Insert, throw-away carbide tooling was used. Whereas previously tool changes were necessary after every 60 pieces, this mechanical tracer holds size through 120 pieces. At that time the cutting edge of the tool is indexed and one simple adjustment reestablishes size.

For more detailed information on this interesting new development, write to Jones & Lamson Machine Company, 511 Clinton St., Springfield, Vermont.

*Write for a showing of our new 16-mm. color-and-sound movie "The Price of Eggs", which explores the reasons behind the wide variations in machining costs.*

Turret Lathes • Fay Automatic Lathes • Milling & Centering Machines • Thread & Form Grinders • Optical Comparators • Thread Tools

Famous PRATT & WHITNEY AIRCRAFT J57 Jet Engine, power plant for Air Force "Snark" guided missile, is geared for both commercial and military performance by Perkins. Typical tolerances on Perkins gears: .0004 tooth to tooth; .0015 cumulative; .0005 on involute. On spline: .0006 tooth to tooth; .0008 cumulative; .0005 on involute. Most Perkins gears are carburized, hardened and ground.

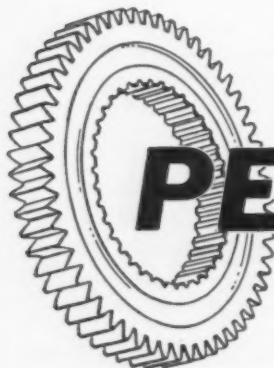


## PRECISION for top-flight performance!

Rigid PRATT & WHITNEY AIRCRAFT precision requirements spell performance . . . top-flight performance. Reason: The future is at stake. And that future can well ride on gear teeth. Since 1940, PRATT & WHITNEY AIRCRAFT gear tolerances have been Perkins' standards . . . for commercial gears as well as aircraft. Such precision pays off in longer wear, greater efficiency, lower maintenance cost. That type of precision can pay off for you, too.



*This Handy Gear Calculator, easy to use, saves time. Folder illustrating Perkins custom precision gears and facilities offers information. Both yours on request.*



# PERKINS

MACHINE AND GEAR CO.

Dept. 51 West Springfield, Mass.  
Telephone: REpublic 7-4751

## TECHNICAL BRIEFS

eastern steel mill. Built by Morgan Engineering Co., Alliance, O., the huge units handle 17-ft-high ladles with an outside diameter of 17 ft at top and 13 ft, 10 in. at bottom.

With a minimum lining thickness, each ladle holds 375 tons of hot



Ladles handled by the three big cranes are 17 ft. high. Each holds an entire 375-ton heat.

metal—one complete heat of an open hearth furnace. Total weight of each crane and electrical equipment, not including ladle and hot metal, is over 920 tons.

**Controls Vital**—The electrical drive and control systems for all three cranes were supplied by the General Electric Co., Schenectady, N. Y. Seven control panels have ratings from 100 to 2500 amp.

Eleven mill type motors, ranging from 33 to 360 hp and totalling 1660 hp, are required for each of the three cranes. Each has a 720-hp duplex drive on the main hoist.

## Handling

**Mill trailer handles ten-ton molten ingots**

A special team of tandem tractors and a low-bed trailer with brick lined boxes for molten ingots is a combination which now has a year of performance behind it. It's been responsible for considerable savings in time and costs.

It's a cross-town trip to the rolling mill of Dominion Foundry and Steel Co., Hamilton, Ont. It's done on a four-shift, 24-hour-a-day basis,

*WE* wouldn't be in business, if *YOU* couldn't

# cut costs with these unusual refractories!



- A** Nothing resists abrasion like an abrasive, such as silicon carbide. Here, for example, is a CARBOFRAX lining that outlasted hard-fired brick on the order of 3 years to 6 months. That's why so many operators are using CARBOFRAX linings in dust collectors, downcomers, coke chutes, and similar equipment exposed to severe wear.



- B** Pictured here is the oil-fired furnace mentioned in the copy. It's used for working 450-lb. drill bits. The dull bits are heated in the right-hand opening to 2000 F, then dressed and returned to the left opening for tempering at 1450 F. At the time of this photo, our refractories had been used for well over 3000 hours—were still in good condition.



- C** The three parts of this furnace that take the most abuse are each made of CARBORUNDUM's super refractories. The hearth and skid rails are silicon carbide. The piers are our electric furnace mullite—still going strong after five years. The skids, when pictured, had been in service three years with no replacement necessary.

Take advantage of the one *good* thing to come out of the recession: EXTRA TIME . . . time to look around . . . time to spot areas where better materials will give you better service—and help cut your operating costs.

**For instance:** Those "vulnerable" areas in your furnace—i.e. areas subjected to flame impingement or heavy loads, or exposed to abrasion or corrosion. Or other "working" areas where heat must pass *through* the refractory. In these spots, you may profit handsomely by substituting one of our special-purpose refractory materials. Materials designed *specifically* to meet these conditions.

- A** **For example:** One customer replaced hard-burned, acid-proof brick in the vertical wall area of a cyclone dust collector with our CARBOFRAX® silicon carbide lining. After three years' service, the CARBOFRAX lining still shows practically no wear. Whereas before, the lining was badly cut out after only a few *weeks*. Quite a saving! . . . in materials, in labor, in downtime.

- B** **For example:** The sidewall, backwall and main arch of an oil-fired furnace were replaced with Carborundum's super refractories because the operator was getting only three months life. After the changeover, life increased 300%!

Granted, Carborundum's refractories cost more. But they also *save* much more—in terms of refractory life . . . furnace downtime . . . and maintenance costs. They also *do* more—in terms of higher furnace output . . . faster heat transfer . . . and increased efficiency. In short, *we* wouldn't be in business if *you* couldn't cut costs with super refractories.

- C** **For example:** In another furnace, 300-lb. annealing baskets and 50-lb. motor heads were pushed directly over a fireclay hearth. But maintenance costs were so high that a CARBOFRAX hearth was substituted. This not only solved the maintenance problem, but also transmitted the heat rapidly—and made possible a *saving of one third in fuel*.



## Here's how you can start cutting costs:

It will take less than an hour to read these two booklets about the applications — and *properties* — of Carborundum's unique, new super refractories. Send for them today.

## Subscription to "Refractories"

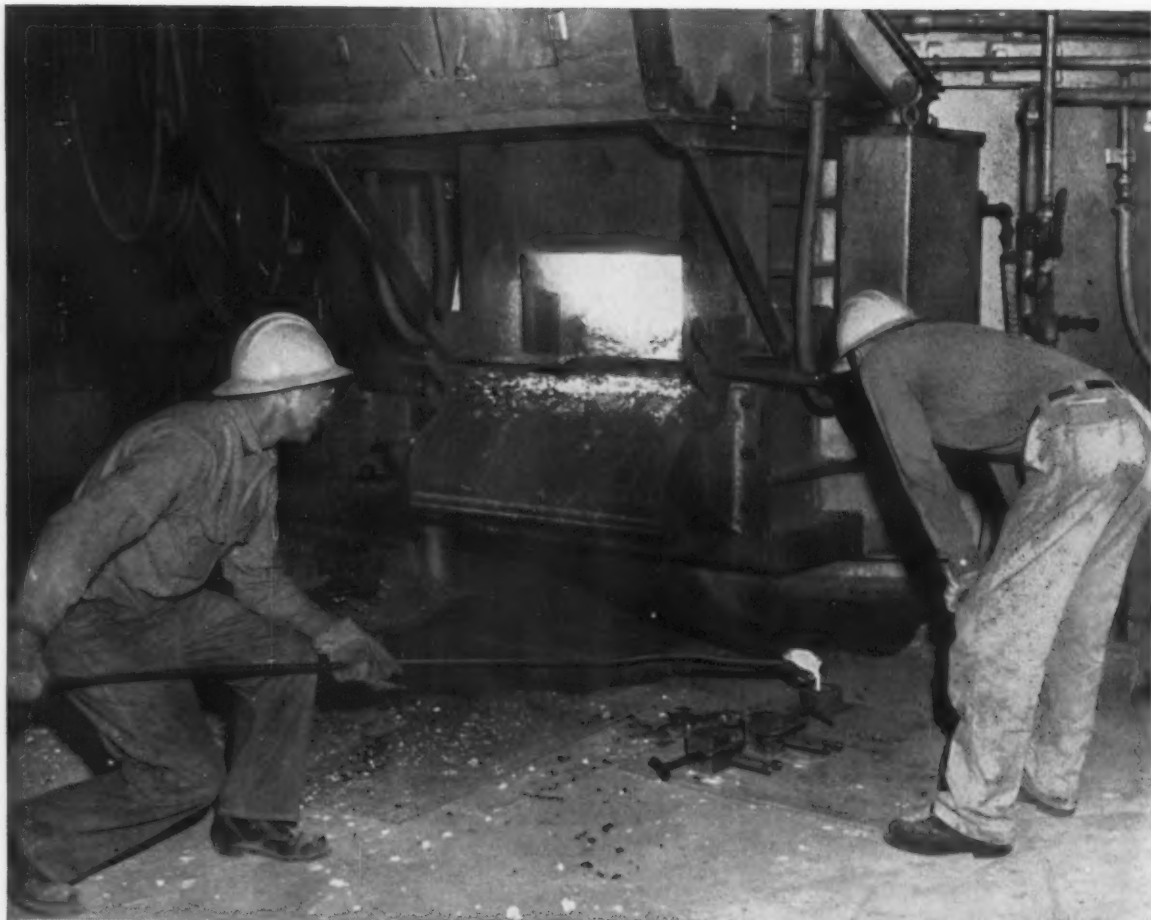
is yours for the asking. This technical brochure is published approximately every other month; contains a wealth of information on new refractory materials, lining techniques, etc. Offer limited, so write soon.



Refractories Division, The Carborundum Company,  
Perth Amboy, N. J., Dept. B-98.

# CARBORUNDUM

Registered Trade Mark



## Wider variety of alloys than ever before now available for castings from Standard

From Standard, you can now enjoy the same superior, personalized service—and rapid delivery—on alloy steel castings as you have enjoyed in the past on carbon steel castings.

Our newly expanded facilities—including installation of a newest design electric furnace—make it possible for us to give you even more complete service than ever before.

We invite you to discuss your next casting needs with us. You will appreciate our personal interest in your problems—and our economical methods of solving them. Write Dept. 1-J.

**Standard Steel Works Division**  
**BALDWIN · LIMA · HAMILTON**

BURNHAM, PENNSYLVANIA

Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes





## TECHNICAL BRIEFS

seven days a week with a cargo of molten ingots weighting 10 tons each.

In solving this transportation problem, Autocar Div., The White Motor Co., Exton, Pa., provided three tandem-axle tractors powered



**Tractor-trailer rigs haul molten ingots in brick-lined boxes.**

by 220-hp diesel engines, five-speed main transmissions, and three-speed auxiliary transmissions. The rear tandem axle is a 60,000-lb capacity bogie.

The lids or covers, which are also brick lined are opened and closed by four hydraulic cylinders. The main transmission provides power to the hydraulics.

## Foundry

### Gaskets withstand high heat in shell mold production

A laminated plastic made with glass fabric bonded with silicone resin turns out to withstand high heat and pressure in making shell molds. The washers, supplied by Taylor Fibre Co., Norristown, Pa., take temperatures up to 500°F and pressures up to 15,000 psi.

In operation of the shell machine, a mix of sand and phenolic resin feeds by gravity from a hopper into the blowhead. It's forced by air through nozzles into the cavity where the shell is molded. The cavity is known as the hot box because of the high temperatures present.

The gasket at the bottom of each nozzle acts as a seal to prevent metal-to-metal contact. It also serves as a barrier to stop transfer of heat from hot box to nozzle.

## for tight weave

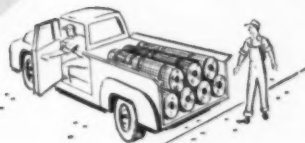
Modern looms, correctly crimped filler wires and uniformly strong warp wires produce a tightly woven wire cloth that lends itself to easy fabrication and long service life.



## INDUSTRIAL WIRE CLOTH

## for square, even mesh

Precise manufacturing techniques and rigid inspection assures absolute accuracy in sizing—an important factor in most screening operations.



## for fast service

CF&I wire cloth salesmen in 40 strategically located offices from coast to coast are prepared to quote prices within minutes and to offer quick delivery of wire cloth from warehouse stocks.

## full range of sizes

from 6" openings down to 200 mesh. All commonly used metals, including plain, galvanized, tin-coated and stainless steels; copper, brass, bronze, aluminum, monel, nichrome and inconel. Packaged in cylinders, boxes, crates or on pallets to meet your needs.

**For further information . . . write or phone our nearest sales office. Ask for a copy of CF&I's Industrial Wire Cloth Catalog.**

6084



## INDUSTRIAL WIRE CLOTH

THE COLORADO FUEL AND IRON CORPORATION

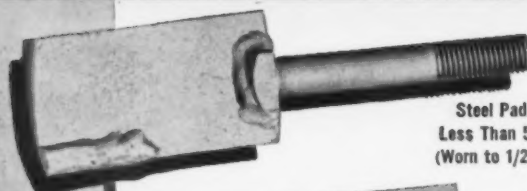
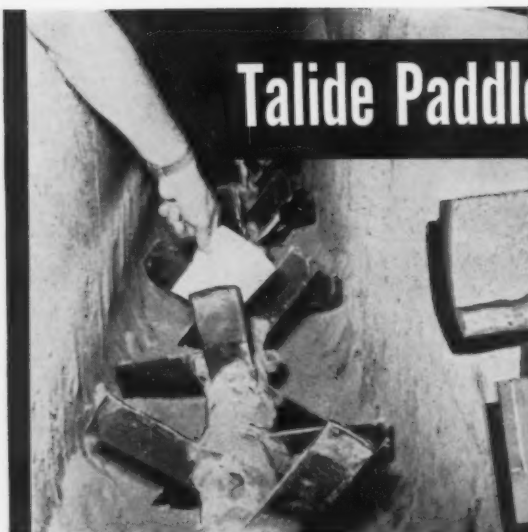
In the East:

WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans  
New York • Philadelphia

In the West:

THE COLORADO FUEL AND IRON CORPORATION — Albuquerque • Amarillo • Billings • Boise  
Butte • Denver • El Paso • Ft. Worth • Fresno • Grand Junction • Houston • Lincoln • Los Angeles  
Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Sacramento • Salt Lake City • San Antonio  
San Francisco • San Leandro • Seattle • Spokane • Wichita • **CF&I OFFICES IN CANADA:**  
Montreal • Toronto • **CANADIAN REPRESENTATIVES AT:** Calgary • Edmonton • Vancouver • Winnipeg

# Talide Paddles Last 50 Times Longer!



Steel Paddle After  
Less Than 50 Hours  
(Worn to 1/2 Length)



Talide-Tipped Paddle  
After 2500 Hours  
(Negligible Wear)

## HARDEST MAN-MADE METAL!

TALIDE METAL, a tungsten carbide of superior quality, is harder, stronger, and more resistant to abrasion than any other metal. Properly applied, it gives superior service on applications where wear, heat, strain, and shock are destructive to other metals.

- **ABRASION RESISTANCE**—Up to 100 times that of steel.
- **COMPRESSIVE STRENGTH**—Higher than all melted, cast or forged metals and alloys.
- **RESISTANCE TO DEFORMATION**—2 to 3 times greater than steel.
- **HEAT RESISTANCE**—Resists oxidation and thermal shock up to 1500° F.
- **THERMAL EXPANSION**—Less than half the rate of steel, "creep" is negligible.
- **FRICTIONAL RESISTANCE**—Lower than steel, non-galling, "slippery" properties higher.

ALL TALIDE METAL grades are made in latest type vacuum electric furnaces by precision methods under rigid control. A wide variety of shapes and sizes can be supplied—up to 25" in diameter, 100" in length, and 5000 pounds by weight. Parts can be supplied to any grit finish required down to one micro-inch. The physical properties of the most commonly used grades are listed below. Other grades are available for specialized applications.

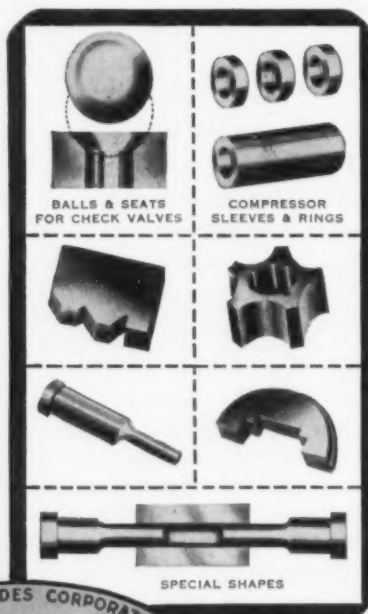
### PHYSICAL PROPERTIES OF TALIDE METAL (P. S. I.)

Application	Operation	Talide Grade	Rockwell "A" Hardness	Specific Gravity (Density)	Transverse Rupture Strength	Compressive Strength	Co-Efficient of Thermal Expansion	Modulus of Elasticity (Deflection)
WEAR SURFACE	No Shock	C-91	91.8	14.90	235,000	710,000	3.00 x 10 <sup>-6</sup>	91,000,000
	Light Shock	C-99	91.0	14.75	265,000	670,000	3.65 x 10 <sup>-6</sup>	84,000,000
	Medium Shock	C-88	89.5	14.55	295,000	635,000	4.00 x 10 <sup>-6</sup>	80,000,000
IMPACT	Light	C-85	88.4	14.25	315,000	600,000	3.75 x 10 <sup>-6</sup>	77,000,000
	Medium	C-80	87.0	13.85	335,000	550,000	4.50 x 10 <sup>-6</sup>	74,000,000
	Heavy	C-75	85.0	13.15	355,000	500,000	5.00 x 10 <sup>-6</sup>	70,000,000

Note: Hardness values may vary plus or minus .2 to .3 on individual lots.

Leading brick manufacturer reports Talide-tipped pug mill paddles have outlasted 50 sets of hard-faced steel paddles to date—and are still in use. Operation involves mixing abrasive ceramic, clay and brick compositions.

TALIDE METAL is saving industry millions of dollars annually by wear-proofing vital parts on machine tools, presses, pumps, compressors and other types of processing equipment used in the steel, oil, chemical, plastic, auto, rubber, textile, glass, ceramic, mining and metalworking industry.



Send for new 76-page catalog  
56-G or ask for sales  
engineer to call.

Metal Carbides Corporation  
Youngstown 12, Ohio



HOT PRESSED AND SINTERED CARBIDES • VACUUM METALS  
HEAVY METAL • ALUMINUM OXIDE • HI-TEMP. ALLOYS  
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

**NEW No. 55  
for extra capacity**

**Super power  
for 1001  
cleaning jobs!**

**No. 95 for general use**

**Furnace cleaning attachments,  
and popular No. 65**

## A Black & Decker Vacuum Cleaner for every use!



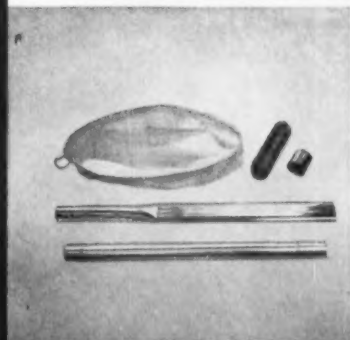
**ACCORDION TYPE HOSE** extends to 10 feet. Tough, durable, sucks in bolts, nuts without harm. Wraps around motor housing for easy storage.

**COMPLETE ACCESSORY LINE** for every need. For furnace cleaning combine No. 65 Vacuum Cleaner with attachment assortment or select No. 648 Furnace Cleaner.



**VERSATILE—COMPACT** enough to fit through narrowest of passageways. Completely mobile. Roll easily over rough floors. No. 55 mounts on 55 gal. drum and dolly.

**HANDY ACCESSORY RACK** on No. 95 carries all attachments you need to do the job. Attached to handle, it can be removed easily for quick cleaning.



Whatever your cleaning problem—office, halls and carpets; factory floors or scrap pick-up, there's a Black & Decker Heavy-Duty Vacuum Cleaner to do the job! All completely mobile—all packed with twice the suction—with plenty of guts for both wet and dry cleaning.

Choose the model you need: No. 65—perfect for general all around use, takes 3¼ gallons of liquid; ⅓ bushel dry. No. 95 for constant, heavy-duty use—13 gallons wet; takes 1½ bushel dry. No. 55 for extra-capacity—mounts on a 55 gallon drum. Mail coupon for free demonstration.

Leading  
Distributors  
Everywhere Sell



# Black & Decker®

Quality Electric Tools . . . Power-Built to set the pace

**MAIL TODAY FOR A FREE DEMONSTRATION**

THE BLACK & DECKER MFG. CO., Dept. 0909, Towson 4, Md.  
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Please arrange a demonstration of

- ☐ No. 55, ☐ No. 65, ☐ No 95 Vacuum Cleaner(s)  
☐ Send additional literature

Name.....Title.....

Company.....

Address.....

City.....Zone.....State.....



☐ Glue Pot



☐ Jig Saw



☐ Drill

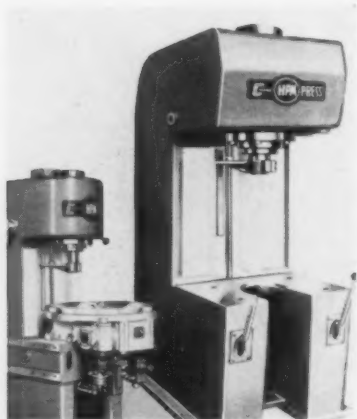


☐ Belt Sanders



# New Production Ideas

Equipment, Methods and Services

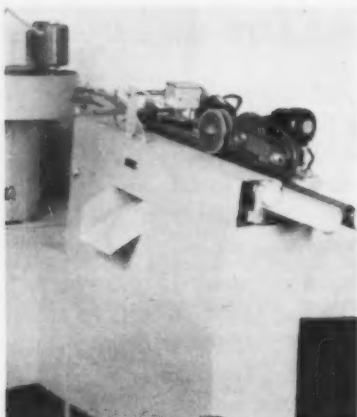


## C-Frame Presses Perform Wide Variety of Jobs

Capacities of 5, 10 and 15 tons are available in a new line of small fast-acting C-frame presses. Two manual and two automatic types are being introduced, with all models designed to J. I. C. recommendations. On the manual presses, servo-controls permit the operator to apply ram pressure force on the work at speeds and pressures directly proportional to the movement of the hand lever. The basic automatic model provides controls

for either single or automatic cycle, and ram reversal to either distance or pressure settings. The new hydraulic index table features a work circle of 16 in. with either 6, 8, or 12 stops for the mounting of tooling. It's rated to carry a full work load of 100 lb at speeds of 80 indexes per minute. There's ample space to permit tooling for almost any type of operation. (The Hydraulic Press Mfg. Co.)

For more data circle No. 50 on postcard, p. 105

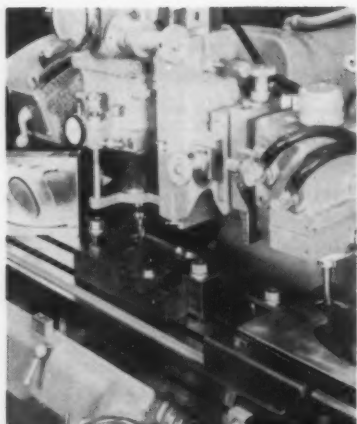


## Unit Feeds Cylindrical Parts to Grinder

Handling a variety of sizes and shapes regardless of length to diameter ratio, a new unit feeds cylindrical parts to a centerless grinding machine. It orients the parts so that they are fed as a continuous tube. The machine can be changed over from one size to another in 15-20 minutes with no change-over parts needed. The linear rate of feed is in excess of 100 ipm. Electronic control insures that the unit doesn't over-feed. Range of cyl-

indrical parts handled varies from  $\frac{3}{8}$  to 3 in. diam. The unit combines many features long sought by makers of items such as ball bearing and needle bearing races. Square races, those having diameter equal to length, offer no difficulty in orienting. The feeding unit can also be used to feed similar parts to other operations such as stamping, forming and printing. (U. S. Engineering Co.)

For more data circle No. 51 on postcard, p. 105



## New Tracer Controls Three-Dimensional Milling

A three-dimensional hand guided hydraulic tracer controls milling on a new model milling machine. While the new miller retains the basic advantages and design of former models, the principal difference is in the type of tracing equipment. The new 3D unit controls the direction of traverse of the table and saddle for 360° horizontal profiling, and the vertical movement of the spindle quill for vertical profiling. Deflection of the stylus

results in a corresponding movement of the table, saddle, and spindle quill, separately or together. Hydraulic motors perform the work of traversing the saddle and table units through feed screws engaging anti-friction nuts. Tracer finger displacement controls 360° horizontal feed rates, with a maximum of 25 ipm. Eight spindle speeds range from 215 to 5650 rpm. (The Cincinnati Milling Machine Co.)

For more data circle No. 52 on postcard, p. 105





# Stainless Steel Heads

## stocked by Carlson

- ▶ keep your working capital working
- ▶ save you money
- ▶ give you prompt delivery



This Carlson Stainless Steel Heads File-Folder includes lists of Dies for press forming and information on flange machining.

It pays to design and build equipment with this stock in mind. You don't have to tie up your working capital in shell plates, pipe and fittings while you wait eight or ten weeks for tank heads. You'll save money by using the less expensive stock sizes that are pressed, rather than odd sizes that must be spun. You also save time when you need stainless steel heads for new construction or for emergency replacement.

The Carlson stock is made up of ASME and Standard flanged and dished stainless steel heads. They range from 10" O.D. through 72" O.D., in 6" increments,  $\frac{3}{8}$ " through  $\frac{3}{4}$ " Gauge, in Types 304, 304-L, 316, and 316-L. All are fully annealed and pickled after forming to provide maximum corrosion resistance. Flanges can be machined to your specifications in a matter of days.

In addition to maintaining the country's largest stock of stainless steel heads, dies are available for pressing heads in other grades of stainless. Special sizes can be spun when required. To get all the facts on this unusual Carlson service write, wire or phone for complete information.

### G.O. CARLSON Inc.

*Stainless Steels Exclusively*

THORNDALE • PENNSYLVANIA

District Sales Offices in Principal Cities



PLATES • PLATE PRODUCTS • HEADS • RINGS • CIRCLES • FLANGES • FORGINGS • BARS and SHEETS (No. 1 Finish)

## NEW EQUIPMENT

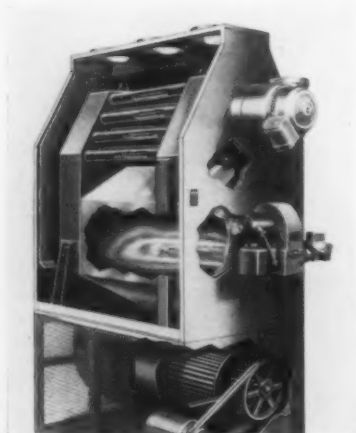


### Ultrasonic Machine Tool for Small Shops, Labs

A compact bench-model ultrasonic machine tool will handle both production and experimental machining of hard, brittle materials. Its effective machining range is from 1/64 to 1 in. in such materials as germanium, silicon, ferrite, hardened steel and carbide. Typical jobs it will handle include cutting, drilling, engraving, slicing, dicing,

and the production of complex shapes and forms. On special applications, materials similar to soft steel can also be machined. A magnetostrictive transducer will provide up to 25,000 machining strokes per second. An automatic tuning device compensates for tool wear. (The Sheffield Corp.)

For more data circle No. 53 on postcard, p. 105

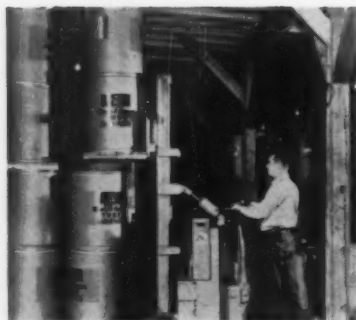


### Direct-Fired Heaters Stress Efficient Burning

The stainless-steel combustion chamber of a line of direct-fired heaters features four-point floating suspension to allow free movement during heating and cooling cycles. It's a diamond-shaped chamber said to be the most efficient for optimum combination of combustion volume with scrubbing action. Extra efficiency and heat transfer is gained through economizer tubes above the combustion chamber. Swaging of the tubes into headers eliminates stresses and buckling. A

single-panelled tube cleanout plate exposes all the economizer tubes for cleanout. Standard capacities range from 400,000 to 3,500,000 Btu with light oil burners, heavy oil burners, gas burners, or combination oil-gas burners. Power burners, furnished with combustion air blower as an integral part of the burner, allow independent combustion air adjustment and separate induced draft setting. (Arkos Mfg. Co.)

For more data circle No. 54 on postcard, p. 105

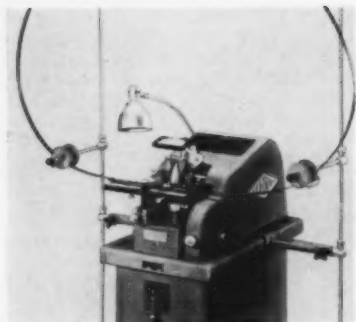


### Compact Lift Truck Stacks in Minimum Space

High stacking of loads in minimum aisle space is the feature of a compact counterbalanced "walkie" truck. The vehicle with 1000-lb capacity has an overall length of 63 3/4 in. Recommended for situations where operating space is at a premium, the truck will maneuver

and high stack goods in aisles as little as 5-ft., 10-in. wide with a load 24-in. long. It is operated from a control handle while walking along with it, thus its designation as a "walkie" truck. The unit is lubricated for life. (Lewis-Shepard Products, Inc.)

For more data circle No. 55 on postcard, p. 105



### Sharpening Unit Adjusts to Band Saw Blades

An attachment for a saw sharpening machine permits automatic sharpening of band saw blades. The rack for holding a blade is simply constructed so that it can be extended in horizontal or vertical position, directly above the machine. By positioning the back guide bar, the guide table will

accept blades from 3/4 to 2 in. width. The guide table adjusts by pivoting so that any desired hook may be put in the teeth. A spring-loaded phenolic roll pushes against the teeth so as to keep the blade against the guide bar. The unit will also sharpen circular and hack saw blades. (Hamco Machines, Inc.)

For more data circle No. 56 on postcard, p. 105



**At National Screw,**  
*Youngstown Special Quality Hot-Rolled  
 Bars are fed into this Hot Nut Former.  
 Quality nuts are produced faster—  
 with fewer rejects.*

## Accent on Excellence

### Youngstown special quality hot-rolled bars

Uniform high product quality is most important in nuts and bolts, too. If fastening assemblies fail, industrial and consumer products become worthless.

So Cleveland's National Screw & Manufacturing Company specifies Youngstown Special Quality Hot-Rolled Bars to maintain their product's quality at an unwaveringly high level. That's because they find Youngstown Bars are uniformly free of injurious seams, piping, laps and cracks—provide high output of defect-free products.

Wherever steel becomes a part of things you make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".

THE NATIONAL SCREW & MANUFACTURING CO.



THE

**YOUNGSTOWN**

SHEET AND TUBE COMPANY

*Manufacturers of Carbon, Alloy and Yeloy Steel, Youngstown, Ohio*

## NEW EQUIPMENT



### Air-Hydraulic System Speeds Press Action

A new addition to a line of fast-acting air-hydraulic trim presses trims die castings, swages, stamps, blanks, forms, draws and shears. It will also trim plastic moldings and rubber and plastic sheets. This latest model is a 35-ton press with a 48 x 40 in. free working area inside the 4-in. tie bars. It has a 30-in. stroke, approach speed of 1400 ipm, pressing speed of 140 ipm, and return speed of 700 ipm. The

unit is 11 ft high and weighs 19,000 lb. A special fast-acting valve allows free flow without cavitation. As the ram travels, a solid column of oil is forced in behind the piston by 20-psi air pressure. Just prior to the trimming cycle, a cam cuts pump pressure in for shearing action of the press. In this manner extremely high cycling speeds are obtained. (B & T Machinery Co.)

For more data circle No. 57 on postcard, p. 105

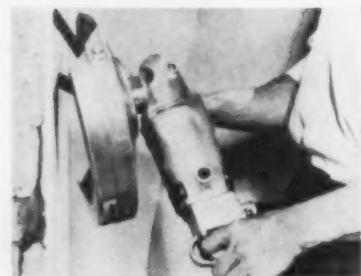


### Rolling-Mill Motors Feature Quick Maintenance

A new line of direct-current motors is the result of a survey to determine ways to reduce downtime for maintenance. Quick removable covers over both ends provide immediate access to motors. With no cover bolts used, covers can be removed in little more time than it takes to attach a crane cable to the lifting eyes. New constant-pressure carbon brush holders are standard for both reversing and

non-reversing mill motors. Inspection lights and utility outlets are conveniently located inside the motor. For reversing hot mills, a new mounting arrangement puts both upper and lower motors and thrust bearings in the open where they are easily accessible. In accordance with NEMA Standards, the units are forced ventilated. (General Electric Co.)

For more data circle No. 58 on postcard, p. 105



### Unit with High-Speed Blades Prepares Surfaces

Weighing 3¾ lb including motor and operating on ordinary house current, a versatile new tool prepares or cleans surfaces. Four blades each with 24 steel blades bent in hairpin shape, rotate at high speed to provide clean, quiet cleaning action. A two-year field

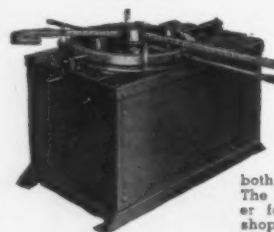
testing has shown successful performance on metals, wood, brick, stucco and masonry. With non-drill type portable motor, the unit gives controlled cleaning without burnishing, polishing, pitting or gouging surfaces. (Roto-Scaper Co.)

For more data circle No. 59 on postcard, p. 105

### KARDONG FOUR-WAY BENDER

For Concrete Reinforcing Steel

Model D-2



The Model D-2 Kardong Bender is a Four Direction Horizontal Bender. With this bender it is not necessary to turn bars over to make reverse or second bends on beam bars. The Model D-2 is made in two sizes. Model D-2 Standard 6-inch, which will bend bars around collars 2-inch to 6-inch and Model D-2 Special 8-inch, which will bend bars around collars 2-inch to 8-inch. Capacity of both models, 1¼-inch Square Bars. The Model D-2 is a production bender for reinforcing steel fabricating shop. Ask for catalog of our complete line of reinforcing bar benders.

**KARDONG BROTHERS, INC.**  
MINNEAPOLIS 13, MINN.

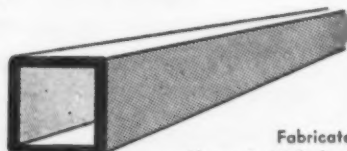
### SPECIAL . . .

#### Square & Rectangular Steel Tubing

Fabricated to Your  
Exact Length

2 x 4  
to  
8 x 8

10 Gauge  
to  
¾" Wall



Fabricated  
Shapes to 20 ft. Long.

**Harrison SHEET STEEL CO.**

FABRICATORS FOR INDUSTRY SINCE 1928

4718 W. 5th AVE., CHICAGO 44



## INCREASED PRODUCTIVITY

*not merely* **INCREASED PRODUCTION**  
*will widen your profit margins*

Testing offers a new production tool to increase productivity at very low cost. Early detection of all parts headed for the scrap heap enables you to take corrective action *before* additional machining costs are invested in them.

**THE PRODUCTION MANAGER** will be able to maintain established quality levels (or meet new higher standards)—eliminate intermittent excessive scrapping of finished parts and often even reduce normal parts scrappage.

**THE SALES MANAGER** will benefit from consistent reliable quality—increased customer satisfaction—reduced or stabilized costs—increased competitive ability.

**HIGHER PROFIT PERCENTAGE** will result because the returns will be increased from your present man-hours and plant investment.

Can you afford to overlook these benefits? Write today for a free copy of "Lower Manufacturing Costs", an informative booklet. Or, ask our Field Engineer to discuss where and how low-cost Magnaflux Test Systems have helped others increase plant productivity.



The Hallmark of

*Quality*

in nondestructive test systems

MAGNAFLUX CORPORATION

• 7302 W. Lawrence Avenue, Chicago 31, Illinois



**Copper-Coated Strip**, shown before heat-treat at Victor Adding Machine, prevents distortion of precision parts during case hardening of working surfaces.



**Plain Steel** number dials are welded to precision-made Thomas Strip.

## Victor Adding Machine, Others Cut Costs, Improve Products With Thomas Strip

Manufacturers across the country are reporting new cost-cutting, quality-boosting results from their use of Thomas Strip's cold-rolled specialty steels.

At Victor Adding Machine Company, Chicago, for example, copper-coated Thomas Strip slashed one major production cost by 50% and made big savings in another operation.

Fred E. Rolli, Victor's chief engineer, says Thomas Strip is "the greatest single improvement in our production process in the past 10 years."

Here's why:

Victor's deluxe Model 75 contains 2500 individual parts, 68 of the most critical being made from Thomas Strip, both plain and copper-coated.

- **Distortion-Free.** Load-bearing parts—with tolerances under .001 inch, plus or minus, have to be case hardened along their sheared edges. Heat-treating plain steel (15 minutes at 1450 degrees) can warp the stamping. Often the expensive straight-

ening process caused tiny surface cracks which elongated the part past the .001-inch tolerance.

To solve this problem, Victor turned to copper-coated Thomas Strip. Since the electrolytic layer of copper stops off or blocks carburizing gases, flat surfaces of the stamped part are protected. Then, plain steel edges case harden properly. The part retains flatness and proper ductility. Since there is no distortion, piece straightening of copper-coated parts is eliminated. This accounts for the 50% reduction of the total straightening operation at Victor.

- **More Savings.** A second economy begins in the punch press. Die-life is a vital factor of production costs. Like other users of copper-coated Thomas Strip, Victor finds die-life between grindings is extended as much as 33%. This is due to the lubrication effect of the copper coating.

A third benefit: uniform temper and on-spec composition of Thomas Strip mean clean, burr-free sheared

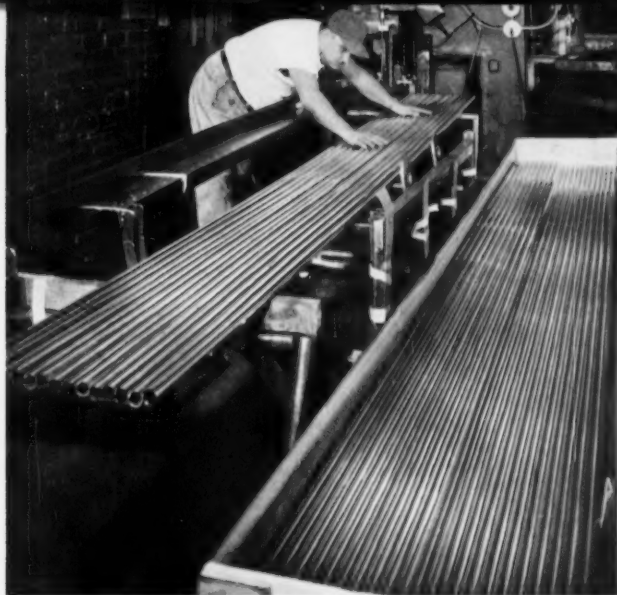
edges. Burrs, like slivers, are banes of close-tolerance operation of machine parts.

- **Satisfied.** Engineer Rolli sums it up by saying:

"Elimination of straightening is one of the biggest boons to small parts manufacturers that I've seen in the business. Even if Thomas Strip had no other benefits than eliminating a production problem, using copper-coated strip would be entirely worthwhile."

Thomas Strip's advantages are the same throughout industry. Other examples of how manufacturers cut costs, improve products—get higher profits and increase sales are shown here.

Thomas Strip's newly expanded and diversified production facilities give you the full range of products on these pages, in addition to zinc and chrome coatings . . . or hot-dip coated with lead alloy or tin. Uncoated Thomas Strip products include low carbon, alloy and high carbon spring steel grades.



**Steel's Strength, Brass' Beauty** are combined economically to form lock-joint tubing at Van Huffel Tube Corp., Warren, Ohio. Largest producer of rolled shapes in the nation, Van Huffel uses clear-lacquered, brass-coated Thomas Strip to make tubing for variety of products, including curtain rods and lamps. Thomas' brass and lacquer coatings easily withstand forming pressures and resist roll damage to the finish. Tubes usually need no further surface finishing. Van Huffel has been a satisfied Thomas Strip user for 26 years.



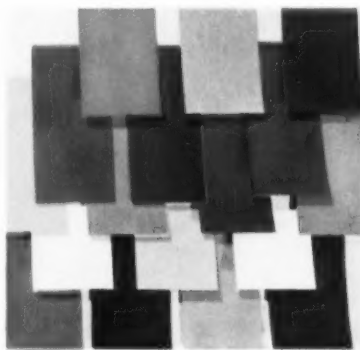
**Capacity Up 25%, Sales Up 45%** since Automatic Wire Goods Manufacturing Co., Bronx, New York, started using Thomas' nickel-plated strip 5 years ago. President Irving Spiegel says Thomas Strip boosted quality, kept production costs constant, improved appearance and design of his extensive Jewel and Automatic kitchen utensil lines. Thomas nickel-coated strip assures a mirror-like finish, an important feature of sales appeal in the highly competitive utensil field.

All Thomas Strip products can save you money and enhance your product in six important ways:

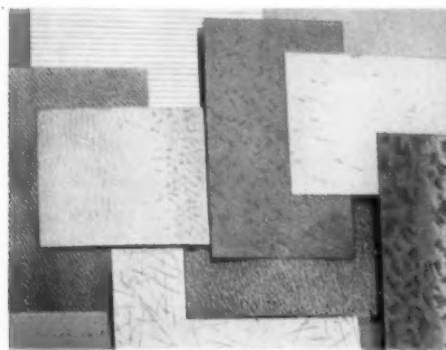
- **Fabricates Easily.** Coated steels stand fully as much fabrication as uncoated strip.
- **Longer Die Life.** Most coatings lubricate dies, reduce wear and increase tool life.
- **Maximum Pieces Per Pound.** Precision rolling to extremely close size tolerances gives more square feet of strip per ton.
- **Lower Plating Costs.** Coatings serve as final product finish or as base for further plating or painting.
- **Speeds Fabrication.** Thomas Strip coatings eliminate costly intermediate fabricating steps such as cleaning, buffing, even plating.
- **Steel's Strength and Economy** are combined with beauty and utility of more expensive metals.

All the savings and benefits Thomas Strip specialties are giving to fabricators shown here are available to you. A national sales staff—familiar with design and fabrication advantages of Thomas Strip is ready to serve you.

Write for samples, and additional cases of users' actual experiences with Thomas Strip products. Do it today!



**The Rainbow's Range** of colors, lacquered or painted on precision cold-rolled strip will solve your decorative and design problems. Thomas Strip's new lacquer line is the industry's finest. It's capable of wider widths in a fuller range of colors, especially pastel shades. Besides appearance, lacquer-coated steel is rugged and can be readily formed or mildly drawn without damage to the product's finish.



**Unlimited Design** opportunities come with pattern-rolled strip. New facilities enable Thomas to offer wider widths of any design and coating, including clear or colored lacquer. Users agree pattern-design enhances product sales appeal, permits production economies by eliminating piece buffing and costly further finishes. Pattern-designs stand up under tough forming operations and still offer attractive, flaw-free surfaces.

**Thomas Strip<sup>®</sup>** Division  
**Pittsburgh Steel Company**  
 Grant Building • Pittsburgh 30, Pennsylvania

**District Sales Offices:**

Atlanta  
Chicago

Cleveland  
Dallas

Dayton  
Detroit  
Houston

Los Angeles  
New York  
Philadelphia

Pittsburgh  
Tulsa  
Warren, Ohio



#### DIRECT

At end of cut, operator spins speed selector handwheel to new setting. Hydraulic power shifts gears while operator indexes turrets and repositions tools for next cut. There is no waiting, no stopping of spindle, no releasing of clutch.

#### PRE-SET

While machining is being performed, operator sets speed selector on desired speed for next cut. When ready to change, he simply taps Hi-Lo lever to initiate shift, and is free to index and ready tools for next cut.

#### HI-LO

During either direct or pre-set operation, operator can reduce speed instantly in 8:1 ratio on Ram Type and 6:1 ratio on Saddle Type Turret Lathes by depressing Hi-Lo lever. Ideal when going from drilling, turning or boring to threading, forming or reaming. Raising Hi-Lo lever returns spindle to original speed.



No computing. Operator rotates knurled dial until desired surface speed shows in window. Then he aligns work diameter number with Hi-Lo lever to obtain correct spindle speed.

## WHY WAIT LONGER?

**Get fast, smooth, effortless speed changes with Gisholt Hydraulic Speed Selector**

A turn of this handwheel can influence your profit picture.

Offering a choice of pre-set or direct operation, the Gisholt Hydraulic Speed Selector eliminates time lost waiting for gears to shift. Your operator does not stop the spindle to make speed changes—nor does he release the main drive clutch. All he has to know are his work diameters. This means he can select the right spindle speeds quickly, effortlessly, without lengthy computation.

Consider what this means to your manufacturing processes: Because it is so easy for your operator to

change speeds, he is continually encouraged to use the most effective speed for every operation, on all diameters, for all materials. Maximum tool life and a finer finish are obtained. Secondary operations are minimized. And your operator doesn't have to work as hard.

The Hydraulic Speed Selector is typical of the many advanced features on the new Gisholt MASTERLINE Ram Type and Saddle Type Turret Lathes.



Hydraulic Speed Selector is standard feature on Gisholt MASTERLINE Ram Type Turret Lathes (up to 16 spindle speeds, up to 25 hp. single-speed driving motor) and on Gisholt MASTERLINE Saddle Type Turret Lathes (up to 24 spindle speeds, up to 75 hp. single-speed driving motor).

Send now literature on MASTERLINE Turret Lathes, Ram ☐ Saddle ☐  
Please have Gisholt representative call ☐

# GISHOLT

MACHINE COMPANY

Madison 10, Wisconsin

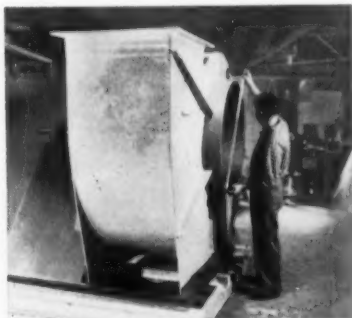
**ASK YOUR GISHOLT REPRESENTATIVE ABOUT FACTORY-REBUILT MACHINES WITH NEW-MACHINE GUARANTEE**



## NEW EQUIPMENT

### Fan Is All Plastic

One of the largest fans of glass-reinforced plastic takes care of ventilation where chemical corrosive fumes are involved. All parts exposed to chemicals are solid plastic

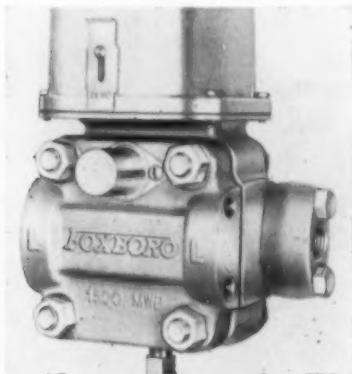


with no painting required on any surface. One of a series of fans, this unit handles 27,000 cfm. (Heil Process Equipment Corp.)

For more data circle No. 60 on postcard, p. 105

### Pressure Transmitter

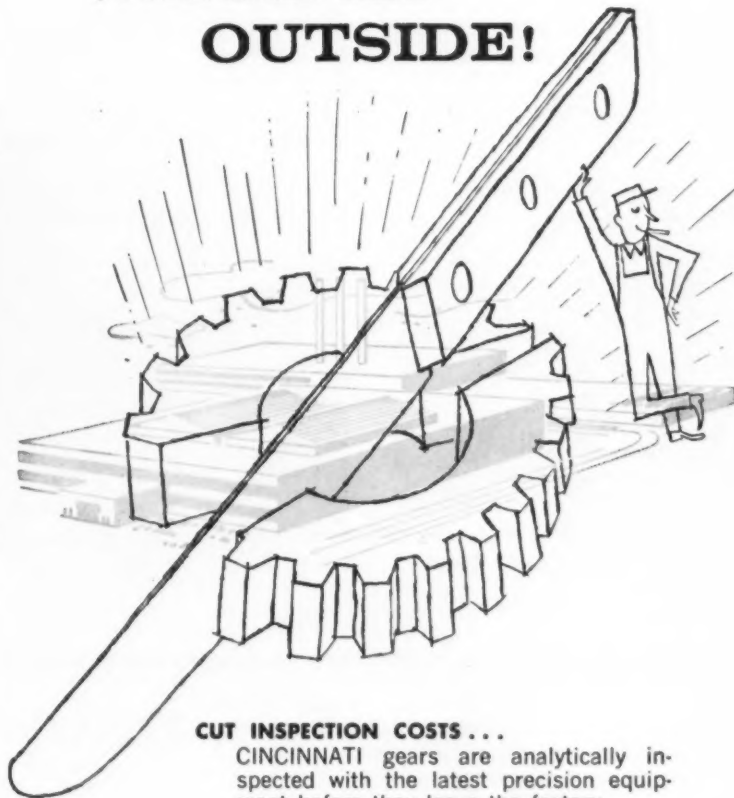
Accurate to 0.5 pct of full scale, a new force balance instrument produces a 3-15 psi linear signal proportional to absolute pressure. Since there's no direct drive of pen or pointer, full transmitter power is available to operate all standard receivers over long distances. The unit is built around a capsule-type, twin-diaphragm sensing element.



Measurement ranges adjust continuously between 0-50 and 0-250, or 0-200 and 0-850 in. of water absolute. Maximum operating temperature is 250°F. (The Foxboro Co.)

For more data circle No. 61 on postcard, p. 105

## Cut your "in-plant" gear costs ...from the OUTSIDE!



#### CUT INSPECTION COSTS...

CINCINNATI gears are analytically inspected with the latest precision equipment before they leave the factory.

#### CUT PRODUCTION DELAYS...

CINCINNATI GEAR'S unique production control system assures a prompt delivery schedule maintained as promised.

#### CUT ASSEMBLY COSTS...

CINCINNATI GEAR's consistent quality guarantees minimum assembly time.

#### CUT CAPITAL EXPENDITURES...

CINCINNATI GEAR's higher machine utilization means lower costs for you.

Shaving capacity to 39"  
Tooth Grinding to 25"  
Involute charts furnished

Write for latest brochure



**GEARS,**

*good gears only*

**THE CINCINNATI GEAR CO.**

Wooster Pike and Mariemont Ave.

Cincinnati 27, Ohio

Custom Gear Makers Since 1907

## NEW EQUIPMENT

### Surface Illuminator

Using a standard 500-w projection bulb with no transformer required, a new surface illuminator brings out a clear image wherever



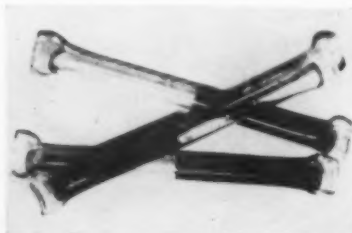
a design or contour has to be picked up against an opaque background.

It's a compact unit which readily fits any of the maker's line of projectors without alteration or fastening device. The mirrors are adjustable permitting use of the unit for all magnifications from 10 to 100X. (George Scherr Co.)

For more data circle No. 62 on postcard, p. 105

### Sealant Locks Threads

A polyethylene capsule contains enough liquid lockwasher to lock



five 1/4-in. nuts or one 3/4-in. nut. It will retain a 2-in. bearing that is 0.002 in. loose or seal a 1-in.

threaded hydraulic connection. The capsule is a convenient way of applying the thin liquid polymer that hardens only when confined between closely fitting metal parts. Catalytic action of the metal surfaces, aided by the absence of air, causes the sealant to harden into a tough, heat- and oil-resistant bond. (American Sealants Co.)

For more data circle No. 63 on postcard, p. 105

### High Pressure Valves

Direct solenoid operated valves for pressures up to 3000 psi are available for operation on 12, 24, or 125 v direct current. Valve ratings for oil and water pressures range from 0-250, 0-1500, and 0-3000 psi. Air valves rate from 0-250, 0-1000 and 0-1500 psi. Metal-to-metal sealing surfaces continue to lap themselves with each operation to maintain sealing quali-

## 45 master keys to



Type 302\*  
Type 304  
Type 304L  
Type 309S  
Type 309Cb  
Type 310  
Type 316  
Type 316L  
Type 316Cb  
\*Ornamental

Type 317  
Type 317L  
Type 320  
Type 321  
Type 347  
Type 348  
Type 410  
Type 430  
Type 442

Type 443  
Carpenter 7Mo (329)  
Carpenter Stainless  
No. 20Cb  
Titanium 40, 55 and 70  
Zirconium  
Zircalloy II & III  
19-9DL & DX  
Invar 36  
HyMu 80

Multimet Alloy (N-155)  
Haynes No. 25 (L-605)  
Hastelloys B, C, F & X  
Armco 15-7Mo PH  
Armco 17-7PH  
A-286  
16-25-6  
Type 201  
Type 202  
Low Expansion "42"  
and "49"

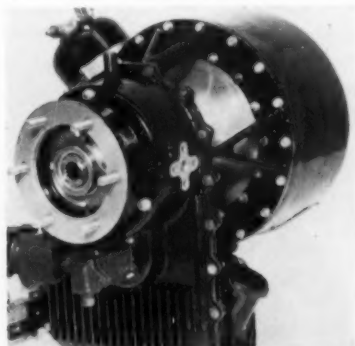
**available through representatives and distributors in over**

ties. Explosion-proof solenoid housings are available. (Barksdale Valves)

For more data circle No. 64 on postcard, p. 105

## Gas Turbine Package

Comparable in size to a typewriter, a new gas turbine engine puts out 30 shaft horsepower. The



unit is 16 in. high and 13 in. wide and weighs 45 lb. With output shaft speed rated at either 6000 or 8000 rpm, it can serve as a power drive for generators, alternators, liquid

pumps, freon and air compressors, blowers and many other applications. (AiResearch Mfg. Div., The Garrett Corp.)

For more data circle No. 65 on postcard, p. 105

## Safety Swivel Hook

Positive locking on a new safety swivel hook eliminates human error. A load cannot be lifted without the gate or yoke automatically locking.



To open, you must manually press the hook against a compression spring. The yoke or gate is made of manganese bronze alloy (110,000 psi). Smooth design allows full throat opening and also keeps the hook from catching on projections or ledges. (Newco Mfg. Co.)

For more data circle No. 66 on postcard, p. 105

## Unit Locks Gland

An insert uses the compressive strength of tough, durable plastic to retain the packing gland and to keep the required packing adjustment of the maker's line of air and low pressure hydraulic cylinders, class 1 and 2. The unit can be adjusted repeatedly without impairing its locking power. It's an integral part of the gland and there are no extra parts to complicate maintenance. As a unit, the gland is interchangeable with glands on all earlier models of cylinders. (Galland-Henning Nopak Div.)

For more data circle No. 67 on postcard, p. 105

# cost-saving corrosion control

● Whatever it takes, Carpenter makes in stainless and high alloy tubing and pipe to most effectively and economically combat most corrosive agents. On the opposite page is a wide variety of standard and special-purpose analyses that can be supplied.

What's more, you get predictable performance in all full finished Carpenter corrosion-resistant tubing and pipe... it fully meets the high quality requirements for heat exchanger service. No short-cuts... no false economy... just the kind of on-the-job service that saves you operating dollars.

You can save up to 40% in first-cost dollars by using Carpenter stainless and high alloy tubing and pipe. Their overall consistent uniformity of O.D., I.D., gauges and physical properties assures you trouble-free, time-saving fabrication and installation.

Whatever your corrosion problem... ordinary or unusual... you'll get the right answer at Carpenter—

"The House of Corrosion Control". You'll benefit from over 30 years' experience in helping industries and equipment builders to solve a vast assortment of problems.

Readily available to you are data on any specific alloy you're interested in, or our Selecting and Buying Guide to your 45 master keys to cost-saving corrosion control. Contact our nearest office or authorized distributor, or write direct to The Carpenter Steel Company, Alloy Tube Division, Union, N. J.



**40 cities . . . coast to coast**

**stainless tubing & pipe**



that keeps metals  
**ON THE GO!**

**METAL**  
Metals Make It Better... For Less  
**SHOW**  
CLEVELAND PUBLIC HALL  
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OCTOBER 27-31

Every year for 39 years the METAL SHOW has attracted throngs of men who stake their future on metals. They are the Metals Engineers, Designers, Administrators, Production Chiefs concerned with the conversion of metals to profits, a feat that calls for particular technical alertness and adaptability in today's ever-changing metal market.

Greater design challenges, intensified competition, and increasing costs create the background against which astounding new ideas will be revealed this year in Cleveland's Public Hall, October 27 to 31... problem-solving hints presented by hundreds of exhibits and technical sessions unfolding new materials, processes, techniques, and finishes.

A visit to the METAL SHOW dissolves mental cobwebs, offers a fresh outlook, stimulates ideas, blends your thinking into an all-metals atmosphere technically slanted to solve your problems.

Keep Metals on the go; **COME TO THE SHOW**

*Metals Engineers come to you...*

when you exhibit in the METAL SHOW.  
Demonstrate how to **MAKE IT BETTER FOR LESS**  
...WITH METALS. Wire for exhibitors folder.

**NATIONAL METAL CONGRESS and EXPOSITION**

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Industrial Heating Equipment Association; Metal Powder Industries Federation; Metal Treating Institute; Special Libraries Association, Metals Division; and the extensive programs of the American Society for Metals with the new Bill Woodside Memorial Sessions, and Metallurgical Seminar.



# The Iron Age Summary

## Auto Strike Wouldn't Kill Market

**Upturn is broad-based enough to continue despite a walkout in automotive.**

**Mills note a pickup in advance ordering as hedge against overnight demand spurt.**

■ An automotive strike wouldn't necessarily knock the props from under the strengthening steel market.

Market strength is coming from a broad cross-section of industry, with the auto firms contributing only partly to the upturn. Of course, a peaceful settlement of Detroit's labor problems would be a further guarantee of a continued rise in steel demand.

**Sharp Competition**—An auto strike—if one comes—would likely be short-lived. Chances are that if the auto workers strike one of the Big Three, the other two would not become involved immediately.

Steel firms are sharply competitive for automotive business, so they

probably would stock up on semi-finished products even if an auto strike comes. In this way they would be in a position to deliver quickly when the strike ended.

**Backlogs Grow**—Meanwhile, the order books of virtually all steel companies are fattening. Backlogs on some products are growing. This means that some steel users will not get delivery when they expect it. It also means that as orders mount, backlogs and delivery promises will become more extended.

Despite the growing strength of the steel market, some steel users are still playing with fire. Their inventories are at rock bottom and they're pressuring the mills for quick deliveries. The market is competitive enough that the mills are catering to them—for the present. But it's becoming more and more difficult for producers to meet quick delivery demands.

**Ordering Ahead**—At the same time, the mills notice a pickup in advance ordering by a growing list of customers. This hedging against

a possible overnight spurt in steel demand has been prompted by the continued improvement in the overall economic picture.

Industries which have stepped up their ordering include appliances, furniture, implements, industrial fasteners, and pipeline operators. (See page 49.)

**Rails Could Improve**—Still to be heard from, is the railroad market. Almost anything would be an improvement in this field. Rail mills, particularly, are practically flat on their backs. The mills figure this market could catch fire at almost any time in the near future. As the economy picks up and railroad carloadings rise, they expect the rails to siphon at least part of this money into much-needed maintenance and supplies.

From a general market standpoint, steel men are counting on a switch in inventory policy from one of depletion to one of build-up. At least one observer looks for steel users to add a million tons to depleted stocks in the fourth quarter.

### Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week	Week Ago	Month Ago	Year Ago
1,809	1,782	1,701	2,100	
<b>Ingot Index</b> (1947-1949=100)	111.5	110.8	104.8	130.7
<b>Operating Rates</b>				
Chicago	77.0	76.0*	76.0	82.5
Pittsburgh	61.5	61.0*	54.5	81.0
Philadelphia	73.5	72.0	71.5	89.0
Valley	54.0	51.0*	49.0	76.0
West	79.0	80.0	72.5	100.0
Cleveland	62.0	54.0	53.0	87.5
Buffalo	54.0	56.0	46.0	100.0
Detroit	75.0	74.0*	69.0	93.0
South	54.0	53.5	52.0	73.0
South Ohio River	75.0	77.0*	72.0	86.5
Upper Ohio River	71.0	70.0*	82.5	99.5
St. Louis	78.0	75.0*	74.0	77.0
<b>Aggregate</b>	67.0	66.0	63.0	82.0

\*Revised

### Prices At a Glance

	This Week	Last Week	Month Ago	Year Ago
(Cents per lb unless otherwise noted)				

#### Composite price

Finished Steel, base	6.196	6.196	6.188	5.967
Pig Iron (gross ton)	\$66.49	\$66.49	\$66.49	\$66.42
Scrap, No. 1 hvy (Gross Ton)	\$43.17	\$42.83	\$41.83	\$46.67
No. 2 bundles	\$29.17	\$29.17	\$29.50	\$36.34

#### Nonferrous

Aluminum ingot	26.80	26.80	26.80	28.10
Copper, electrolytic	26.50	26.50	26.50	27.00
Lead, St. Louis	10.55	10.55	10.80	13.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	95.625	94.50	95.25	93.75
Zinc, E. St. Louis	10.00	10.00	10.00	10.00

# Furniture Firms Blend Materials

**Office furniture makers are offering more products featuring combinations of steel, wood, aluminum, and plastics.**

**Some are also providing free office design service with furniture orders.**

■ A marriage of materials is the big new trend in office furniture. Getting together are steel, wood, aluminum, and plastics.

Buyer interest in economy and on increasing demand for aesthetic as well as practical values in furniture are spurring the change.

**Wood-Steel Blends**—It isn't quite the rule yet, but even purists from both sides of the wood vs. steel competition are at least looking in this direction.

Steel is moving in on wood for frames because of its strength and durability. One wood deskmaker is now hanging his material on a steel H-frame. And several are making steel interiors and wood exteriors.

**Aluminum Trim**—Wood, laminated with plastic for wear, or leather for appearance, is making rapid headway for tops. The reason: Despite more varied shapes available as standard, orders for custom shapes are up about 15 pct over last year. It is cheaper to shape a free form from wood than to make the tools needed for steel.

Advances in aluminum coloring and patterns is building its use as trim. General Fireproofing Co., Youngstown, O., uses two-tone anodized patterned sheet as trim in

a new line of executive furniture it calls "Italic." The raised part of the pattern is anodized one color, and the recessed area another.

**Design Service Given**—Market-wise, the situation still favors the buyer. He is being offered more selection and service. Columbia-Hallowell Div., Standard Pressed Steel Corp., Jenkintown, Pa., now offers 14 standard colors, 140 two tone combinations, and a wider option on standard top shapes.

General Fireproofing has set up a subsidiary, GF Studios, to design offices from the floor up. They even have their own exclusive lines of carpets, fabrics, picture frames, and ash trays. If the parent company's products are used there is no cost for the service.

**Prices Steady**—There have been no major moves in office furniture in over a year, mostly because of the sharp competition. Some makers are muttering about the possibilities, but most in the trade expect prices to hold at least through the year.

Business is starting to pick up for office furniture makers after sagging badly through most of the year. Columbia reports orders are up a brisk 10 pct over a month ago. The index of the Wood Office Furniture Institute was up three points last month, and is running another three points ahead this month. If things keep moving that way delivery schedules may extend.

**Wide Choice Offered**—Distributors and dealers are going all out to stock complete lines of finished items. But they are hard put to keep up with the increase in options. Even on fabrics for chairs, General Fireproofing for instance, offers a choice of 120 different colors, patterns, and materials.



**DOWN TO THE ASH TRAYS:** There was one source in designing this office. General Fireproofing Co. made the 80-in. Italic desk and the chairs. Its subsidiary, GF Studios, provided the accessories and fabrics.

**For Rolls...  
Specify**

# Versatile **ACIPCO** *CENTRIFUGALLY SPUN* **STEEL TUBES**



Among the equipment Blaw-Knox Company manufactures for many industries are steel mill roll-out tables. ACIPCO tubes, furnished as cast, 12.43" OD x 9.50" ID, machine cut to 4-ft. lengths, are used as rolls in this Blaw-Knox table.

Because they are centrifugally spun, ACIPCO tubes are dimensionally stable and possess an inherent high degree of dynamic balance. Their dense, homogeneous, inclusion-free grain structure results in good machinability. In addition, ACIPCO tubes are highly resistant to impact, an important requirement for steel mill table rolls.

These advantages, plus the flexibility of ACIPCO's complete "one source—from start to finish" facilities, are reasons why Blaw-Knox specified ACIPCO centrifugally spun tubes for this application.

"Custom-spun" in stainless steel, all carbon steels or special analyses as well as in all alloy irons including Ductile, ACIPCO tubes are furnished to your exact physical, chemical and metallurgical specifications.

If rolls are a part of your products, or if you use tubular metal components in any way, get full information about ACIPCO. Call or write today.

One of the world's leading producers of complete mills and auxiliary equipment for rolling ferrous and nonferrous metals, Blaw-Knox Company also is a major supplier to the chemical, petroleum, food processing, construction and communications industries. The company has its headquarters in Pittsburgh, and manufacturing plants in Pittsburgh and Erie, Pa., Buffalo, Chicago, Mora, Minn., and Wheeling, W. Va.

## **VERSATILE ACIPCO TUBES**

**Size Range:** Lengths up to 410" have been produced to meet modern machinery requirements. OD's from 2.25" to 50"; wall thicknesses from .25" to 4".

**Analyses:** All alloy grades in steel and cast iron, including heat and corrosion resistant stainless steel, plain carbon steel and special analyses.

**Furnished:** As cast, rough machined, or finished machined, including honing. Complete welding and machine shop facilities for fabrication.



**SPECIAL PRODUCTS DIVISION**  
**AMERICAN**  
**CAST IRON PIPE CO.**

BIRMINGHAM 2, ALABAMA



# Advance Orders Gain, Rush Buying Stays

**Two trends in steel buying are in vogue today.**

**Some users are stepping up advance orders.**

**Others are still counting on getting fast delivery.**

■ There are two approaches to steel buying in the current market.

Some users, sensing a tightening market, are placing more advanced orders. As a result mill order books for October and beyond are filling out rapidly. Sheet and bar are among the more active products.

But other buyers still cling to their year-old practice of ordering late for early delivery. However, this process is bringing more and more headaches for both buyers and sellers.

"When the item is stocked in finished or semi-finished shape," says one mill man, "we usually can fill a rush order. But if some processing is needed all the speed in getting the order entered won't deliver the steel faster."

"We got one warehouse order for a type of fabricated structurals last week," says another producer, "and this week the same buyer was back for the same product."

"Customers are still calling the turn," a third mill spokesman comments, "If you can't promise shipment in about ten days they tell you to forget the order."

But, despite all this, the consensus is that the days of easy supply are ending. After automotive labor troubles are settled and automotive steel buyers start buying in force there will be a general tightening in the market.

**Sheet and Strip**—Advance ordering by some buyers is fattening mill order books for October. Automotive steel buyers have played a part in the order upturn. But, for the most part, auto plants are working very close to production in their orders.

Other buyers—including appliance firms, furniture makers, implement manufacturers, and architectural panel suppliers—are more active. Helped by advanced ordering one **Pittsburgh** mill had more than half its October flat-rolled tonnage booked by the first week in September. Some **Chicago** mills also report about 50 pct of their October hot-rolled sheet tonnage is in. Both hot- and cold-rolled sheet are tightening in that area.

**Plate**—"Our customers are operating at about 60 pct of capacity," says spokesman for heavy plate mill on **East Coast**, "and their orders to us show it." Most tonnages, he says, are either to re-fill stocks or for use in meeting immediate production needs. Some sheared plate suppliers do not expect substantial market improvement until new capital spending budgets for 1959 are approved.

**Chicago** plate mills are benefit-

## PURCHASING AGENT'S CHECKLIST

Linepipe sales are due for fast comeback next year. **P. 49**

Cut in mill discounts angers pipe jobbers. **P. 50**

Tool steel is successfully deep drawn. **P. 83**

ing because users who normally get some sheet mill plate are being shut out as sheet and strip demand improves. As a result they are placing more orders with plate mills.

**Bar**—Warehouses are increasing bar supplies in expectation of heavier demand from automotive bar buyers next month. Cold finishers are also stepping up their buying pattern. In some cases they have boosted their October orders from hot-rolled bar mills by 15 pct or more. Both hot and cold-rolled bar deliveries in the Midwest may lengthen about two weeks before the end of September.

**Tinplate**—Mill shipments are still holding at good levels, but new orders are tapering off seasonally. There's been no mill action yet on price increases. Some observers felt prices would go up October 1 as they did in previous years. But deadline for the required advance notice, the end of August, passed without any announcements from producers.

**Stainless**—Incoming orders reached their highest level of the year last month, producers say. Stainless strip was the leading gainer. Mill order books for September look good. October tonnages are coming in slowly as mills see no trend yet toward advance ordering.

**Pig Iron**—Republic Steel Corp. resumed production this week at its Troy, N. Y. blast furnace closed since mid-July. "A general improvement in business conditions," a spokesman says, "created an increased demand for pig iron that could be met only by additional production." The Troy furnace turns out high-grade, low phos pig iron as well as basic, malleable, and foundry iron.

**Steel Service Centers**—Distributors are increasing their mill orders to fill stock gaps left by greater consumer demand. Part of this demand results when buyers turn to warehouses for quick shipment on rush orders. In some cases the distributors are transferring stocks from one branch to another.



# COMPARISON OF PRICES

(Effective Sept. 16, 1958)

Sept. 16 Sept. 9 Aug. 19 Sept. 17  
1958 1958 1958 1957

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Sept. 16 1958	Sept. 9 1958	Aug. 19 1958	Sept. 17 1957
<b>Flat-Rolled Steel: (per pound)</b>				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	4.925¢
Cold-rolled sheets	6.275	6.275	6.275	6.05
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.80
Hot-rolled strip	5.10	5.10	5.10	4.925
Cold-rolled strip	7.425	7.425	7.425	7.17
Plate	5.30	5.30	5.30*	5.12
Plates, wrought iron	13.55	13.55	13.55	13.15
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00

<b>Tin and Terneplate: (per base box)</b>				
Tinplate (1.50 lb.) cokes	\$10.30	\$10.30	\$10.30	\$10.30
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	9.00
Special coated mfg. ternes	9.55	9.55	9.55	9.55

<b>Bars and Shapes: (per pound)</b>				
Merchant bar	5.675¢	5.675¢	5.675¢	5.425¢
Cold finished bar	7.65	7.65	7.65	7.30
Alloy bars	6.725	6.725	6.725	6.475
Structural shapes	5.50	5.50	5.50	5.275
Stainless bars (No. 302)	45.00	45.00	45.00	45.00
Wrought iron bars	14.90	14.90	14.90	14.45

<b>Wire: (per pound)</b>				
Bright wire	8.00¢	8.00¢	8.00¢	7.65¢

<b>Rails: (per 100 lb.)</b>				
Heavy rails	\$5.75	\$5.75	\$5.525	\$5.525
Light rails	6.725	6.725	6.50	6.50

<b>Semifinished Steel: (per net ton)</b>				
Revering billets	\$80.00	\$80.00	\$80.00	\$77.50
Slabs, reolling	80.00	80.00	80.00	77.50
Forging billets	99.50	99.50	99.50	96.00
Alloy blooms, billets, slabs	119.00	119.00	119.00	114.00

<b>Wire Rods and Skelp: (per pound)</b>				
Wire rods	6.40¢	6.40¢	6.40¢	6.15¢
Skelp	5.05	5.05	5.05	4.875

<b>Finished Steel Composite: (per pound)</b>				
Base price	6.196¢	6.196¢	6.188¢	5.967¢

**Finished Steel Composite**  
Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

**Pig Iron Composite**  
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

**Steel Scrap Composite**  
Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

<b>Pig Iron: (per gross ton)</b>				
Foundry, del'd Phila.	\$70.97	\$70.97	\$70.97	\$70.51
Foundry, Valley	66.50	66.50	66.50	66.50
Foundry, Southern Cin'ti	73.87	73.87	73.87	71.85
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.47	70.47	70.47	70.01
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese 74-76 pct Mn, cents per lb½	12.25	12.25	12.25	12.75

<b>Pig Iron Composite: (per gross ton)</b>				
Pig iron	\$66.49	\$66.49	\$66.49	\$66.42

<b>Scrap: (per gross ton)</b>				
No. 1 steel, Pittsburgh	\$44.50	\$44.50	\$44.50	\$48.50
No. 1 steel, Phila. area	39.50	39.50	37.50	45.00
No. 1 steel, Chicago	45.50	44.50	43.50	46.50
No. 1 bundles, Detroit	36.50	36.50	37.50	43.50
Low phos., Youngstown	45.50	46.50	46.50	53.50
No. 1 mach'y cast, Pittsburgh	51.50	51.50	51.50	57.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	56.50
No. 1 mach'y cast, Chicago	53.50	53.50	53.50	48.50

<b>Steel Scrap Composite: (per gross ton)</b>				
No. 1 hvy. melting scrap	\$43.17	\$42.83	\$41.83	\$46.67
No. 2 bundles	29.17	29.17	29.50	36.34

<b>Coke Connellsville: (per net ton at oven)</b>				
Furnace coke, prompt	\$14.50	\$14.50	\$15.38	\$15.38
Foundry coke, prompt	\$18-18.50	\$18-18.50	\$17.50-\$19	\$17.50-\$19

<b>Nonferrous Metals: (cents per pound to large buyers)</b>				
Copper, electrolytic, Conn.	26.50	26.50	26.50	27.00
Copper, Lake, Conn.	26.50	26.50	26.50	27.00
Tin, Straits, N. Y.	95.625¢	94.50	95.25	93.75
Zinc, East St. Louis	10.00	10.00	10.00	10.00
Lead, St. Louis	10.55	10.55	10.80	13.80
Aluminum, virgin ingot	26.80	26.80	26.80	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	33.00

† Tentative. ‡ Average. \* Revised.

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# Stainless Scrap Shortage Looms

**Stainless scrap generation has been down almost a year while mill buying has continued.**

**Now stainless sources are all but dried up.**

■ An acute shortage of stainless steel scrap appears imminent. The reasons:

1. Almost every stainless consumer has been buying up scrap steadily in recent months.

2. The generating rate is low.

3. Many sources dried up earlier this year when prices sank to a recession low.

4. There are no signs that consumer demand will ease in the immediate future.

In Pittsburgh, a major stainless consuming district, prices are nearing the top. Prices there cannot logically rise higher than \$250 a ton for 18-8 bundles and solids and \$130 for 430 bundles and solids. At these levels, it becomes more economical for mills to buy raw nickel. The price of 18-8 in Pittsburgh currently is \$225 to \$230. For 430 it's \$120 to \$125.

Outside of stainless, the scrap market generally is firm although see-sawing prices in several districts indicate some weakness is creeping in at the dealer level.

In Cleveland and the Valley, dealer resistance broke. A sizable tonnage of prime dealer scrap went to a Valley mill at \$1 under the market. Dealers in Philadelphia, Cincinnati, and St. Louis are squirming beneath high inventories and continued mill indifference.

The story is different in Chicago,

where dealer resistance won out and openhearth scrap sold at a dollar higher, sending The IRON AGE No. 1 heavy melting Composite Price up 33¢ to \$43.17.

**Pittsburgh**—Prices continue to hold in a quiet market. A late railroad list showed most grades up slightly from last month. The limited amount of trading in dealer grades is still marked by resistance to lower prices. One buyer reports little interest in a price of \$44 for No. 1 heavy melting. Brokers have had little success buying No. 2 bundles for less than \$32. Stainless grades are strong and active as mills are running into acute shortages. Dealer stocks of cast grades are also low.

**Chicago**—The market continues to hold, pegged by expected strong demand for October and dealer willingness to hold what scrap they already have in inventory. Mill attempts to break the price of railroad No. 1 heavy melting with a \$48 offering failed to bring in scrap. Purchasers with other mills indicate that upward price pressure is continuing.

**Philadelphia**—Optimism has cooled off somewhat and more dealers are letting scrap go at current prices. While no sudden upsurge is looked for, an orderly advance in prices is probable during the fourth quarter. Dealers indicate they would begin unloading their large inventories if prices go up another two or three dollars. New export orders are expected within the next two weeks.

**New York**—Prices are unchanged and the market is quiet. Possibility of new export orders adds strength to openhearth scrap prices.

Dealers are building inventories in anticipation of an expected fourth quarter upturn.

**Cleveland**—Market is temporarily weak as mills hold back on orders and dealers grow apprehensive. A Valley mill bought representative tonnage of prime dealer scrap for \$45, dropping prices \$1 there and in Cleveland. September so far has been a disappointing month. Newest hope is that auto settlement will develop new orders. Local stainless buyers are shying away from prices over \$200, but it would take \$220 to bring in any substantial quantity.

**St. Louis**—The \$1 reduction last week in prices of openhearth grades by district steel mills resulted in a drop of between 15 and 20 pct in the flow of scrap. This week prices are unchanged.

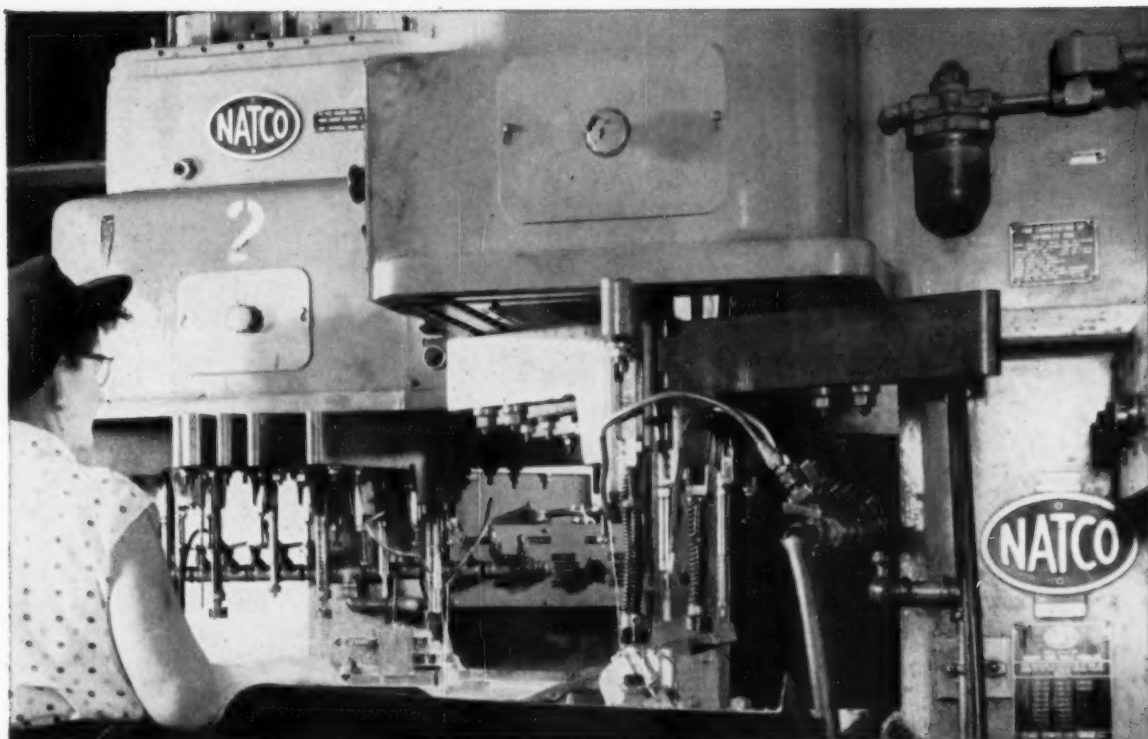
**Birmingham**—An Atlanta mill bought No. 2 heavy melting scrap this week at its previous price of \$32 per ton delivered. With this exception, trading was quiet and confined to small orders.

**Cincinnati**—A very dull market prevails in the area. Scrap orders for the month are filled. Upriver interest is non-existent. Hopes for October depend on auto production. Meanwhile, prices here are unchanged.

**Buffalo**—Lack of buying has kept the market at a standstill here. Dealers feel if a purchase were made now it would be at quoted prices. Meanwhile, the trade is building up its inventories.

**Boston**—There is a firm undertone in the market. Primary steel-making grades are up \$1, as are some turnings and cast grades.

**West Coast**—Scrap intake is sluggish in a dull market. No. 1 cupola cast moved up to \$42 a ton in Los Angeles. Mills are taking only small tonnages needed to maintain inventory levels.



## Ten Natcos like these replaced 170 single spindles!

It's "reduce costs or else" in the hotly competitive carburetor business. That's why Zenith Carburetor Div. of Bendix Aviation Corp. embarked on a tooling program which resulted in substantial savings per casting machined.

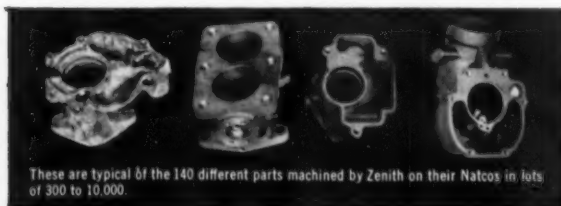
Ten multiple spindle H-6 Natcos provided the greatest savings per machine dollar spent. By combining drilling and tapping operations, the Natcos eliminated the need for 170 single spindles. Look at the cost comparisons on two parts, for example—a die-cast cover and fuel bowl.

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run by two operators on four single spindles using four individual jigs. Now these parts are run on two Natcos by a single operator at a direct cost savings of 81% on the cover and 70% on the fuel bowl.

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Richmond, Indiana

Natco offices in Chicago, Detroit, New York, Buffalo, Boston, Philadelphia, Cleveland and Los Angeles; distributors in other cities.



# SCRAP PRICES

(Effective Sept. 16, 1958)

## Pittsburgh

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	44.00 to 45.00
No. 1 factory bundles	48.00 to 49.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	44.00 to 45.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and ms. turn.	20.00 to 21.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. punch'g's plate	49.00 to 50.00
Heavy turnings	35.00 to 36.00
No. 1 RR hvy. melting	38.00 to 40.00
Scrap rails, random lgth.	54.00 to 55.00
Rails 2 ft and under	57.00 to 58.00
RR steel wheels	52.00 to 53.00
RR spring steel	52.00 to 53.00
RR couplers and knuckles	52.00 to 53.00
No. 1 machinery cast.	51.00 to 52.00
Cupola cast.	44.00 to 45.00
Heavy breakable cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	225.00 to 230.00
18-8 turnings	120.00
430 bundles and solids	120.00 to 125.00
410 turnings	50.00 to 60.00

## Chicago

No. 1 hvy. melting	\$45.00 to \$46.00
No. 2 hvy. melting	38.00 to 40.00
No. 1 dealer bundles	45.00 to 46.00
No. 1 factory bundles	51.00 to 52.00
No. 2 bundles	31.00 to 32.00
No. 1 busheling	45.00 to 46.00
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	25.00 to 26.00
Low phos. forge crops	54.00 to 55.00
Low phos. punch'g's plate	51.00 to 52.00
Low phos. 3 ft and under	49.00 to 50.00
No. 1 RR hvy. melting	49.00 to 50.00
Scrap rails, random lgth.	54.00 to 55.00
Rolling rails	46.00 to 47.00
Rails 2 ft and under	60.00 to 61.00
Locomotive tires cut	54.00 to 55.00
Cut bolsters & side frames	51.00 to 52.00
Angles and splice bars	56.00 to 57.00
RR steel bar axles	71.00 to 72.00
RR couplers and knuckles	53.00 to 54.00
No. 1 machinery cast.	53.00 to 54.00
Cupola cast.	47.00 to 48.00
Heavy breakable cast.	41.00 to 42.00
Cast iron brake shoes	43.00 to 44.00
Cast iron wheels	41.00 to 42.00
Malleable	57.00 to 58.00
Stove plate	44.00 to 45.00
Steel car wheels	52.00 to 53.00
Stainless	
18-8 bundles and solids	215.00 to 220.00
18-8 turnings	125.00 to 130.00
430 bundles and solids	115.00 to 120.00
430 turnings	70.00 to 75.00

## Philadelphia Area

No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	39.00 to 40.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	39.00 to 40.00
Machine shop turn.	20.00 to 21.00
Mixed bor. short turn.	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Shoveling turnings	23.00 to 25.00
Clean cast. chem. borings	30.00 to 31.00
Low phos. 5 ft and under	42.00 to 43.00
Low phos. 2 ft and under	43.00 to 44.00
Low phos. punch'g's	43.00 to 44.00
Elec. furnace bundles	40.00 to 41.00
Heavy turnings	34.00 to 35.00
RR steel wheels	44.50 to 45.50
RR spring steel	44.50 to 45.50
Rails 18 in. and under	57.00 to 58.00
Cupola cast.	39.00 to 40.00
Heavy breakable cast.	43.00 to 44.00
Cast iron car wheels	44.00 to 45.00
Malleable	56.00 to 57.00
Unstripped motor blocks	30.00 to 31.00
No. 1 machinery cast.	49.00 to 50.00

## Cincinnati

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$38.50 to \$39.50
No. 2 hvy. melting	32.50 to 33.50
No. 1 dealer bundles	38.50 to 39.50
No. 2 bundles	25.00 to 26.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	17.00 to 18.00
Low phos. 18 in. and under	44.00 to 45.00
Rails, random length	46.00 to 47.00
Rails, 18 in. and under	55.00 to 56.00
No. 1 cupola cast.	42.00 to 43.00
Hvy. breakable cast.	36.00 to 37.00
Drop broken cast.	47.00 to 48.00

## Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

## Cleveland

No. 1 hvy. melting	\$40.50 to \$41.50
No. 2 hvy. melting	32.50 to 33.50
No. 1 dealer bundles	40.50 to 41.50
No. 1 factory bundles	45.00 to 46.00
No. 2 bundles	27.50 to 28.50
No. 1 busheling	40.50 to 41.50
Machine shop turn.	17.00 to 18.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Cut structural & plates, 2 ft & under	45.00 to 46.00
Drop forge flashings	40.50 to 41.50
Low phos. punch'g's plate	41.50 to 42.50
Foundry steel, 2 ft and under	40.00 to 41.00
No. 1 RR hvy. melting	47.00 to 48.00
Rails 18 in. and under	56.00 to 57.00
Railroad grate bars	57.00 to 58.00
Steel axle turnings	25.00 to 26.00
Railroad cast.	49.00 to 50.00
No. 1 machinery cast.	48.00 to 49.00
Stove plate	44.00 to 45.00
Malleable	61.00 to 62.00
Stainless	
18-8 bundles	215.00 to 220.00
18-8 turnings	105.00 to 110.00
430 bundles	110.00 to 115.00
430 turnings	40.00 to 45.00

## Buffalo

No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 busheling	36.00 to 37.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	27.00 to 28.00
Machine shop turn.	16.00 to 17.00
Mixed bor. and turn.	18.00 to 19.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	16.00 to 17.00
Low phos. plate	40.00 to 41.00
Structurals and plate,	
2 ft and under	45.00 to 46.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	59.00 to 60.00
RR steel wheels	44.00 to 45.00
RR spring steel	44.00 to 45.00
RR couplers and knuckles	44.00 to 45.00
No. 1 machinery cast.	45.00 to 46.00
No. 1 cupola cast.	41.00 to 42.00

## St. Louis

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	16.00 to 17.00
Cast iron borings	18.00 to 19.00
Shoveling turnings	18.00 to 19.00
No. 1 RR hvy. melting	46.00 to 47.00
Rails, random lengths	48.00 to 49.00
Rails, 18 in. and under	53.00 to 54.00
Angles and splice bars	46.00 to 47.00
Std. steel car axles	64.00 to 65.00
RR specialties	47.00 to 48.00
Cupola cast.	48.00 to 49.00
Heavy breakable cast.	38.00 to 39.00
Cast iron brake shoes	38.00 to 39.00
Stove plate	42.00 to 43.00
Cast iron car wheels	40.00 to 41.00
Rolling rails	60.00 to 61.00
Unstripped motor blocks	39.00 to 40.00

## Birmingham

No. 1 hvy. melting	\$35.00 to \$36.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	23.00 to 24.00
No. 1 busheling	25.00 to 26.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	12.00 to 13.00
Electric furnace bundles	39.00 to 40.00
Elec. furnace, 3 ft & under	37.00 to 38.00
Bar crops and plate	45.00 to 46.00
Structural and plate, 2 ft.	44.00 to 45.00
No. 1 RR hvy. melting	39.00 to 40.00
Scrap rails, random lgth.	47.00 to 48.00
Rails, 18 in. and under	51.00 to 52.00
Angles & Splice bars	47.00 to 48.00
Rolling rails	59.00 to 60.00
No. 1 cupola cast.	53.00 to 54.00
Stove plate	53.00 to 54.00
Charging box cast.	22.00 to 23.00
Cast iron car wheels	39.00 to 40.00
Unstripped motor blocks	42.00 to 43.00

## Youngstown

No. 1 hvy. melting	\$44.00 to \$45.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	44.00 to 45.00
No. 2 bundles	29.00 to 30.00
Machine shop turn.	20.50 to 21.50
Shoveling turnings	24.50 to 25.50
Cast iron borings	21.50 to 22.50
Low phos. plate	45.00 to 46.00

## New York

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$28.00 to \$29.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	17.00 to 18.00
Machine shop turn.	8.00 to 9.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	11.00 to 12.00
Clean cast. chem. borings	24.00 to 25.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	35.00 to 36.00
Charging box cast.	34.00 to 35.00
Heavy breakable cast.	34.00 to 35.00
Unstripped motor blocks	24.00 to 25.00
Stainless	
18-8 prepared solids	175.00 to 180.00
18-8 turnings	75.00 to 80.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

## Detroit

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	24.00 to 25.00
Drop forge flashings	33.00 to 34.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Low phos. punch'g's plate	35.00 to 36.00
No. 1 cupola cast.	38.00 to 39.00
Heavy breakable cast.	30.00 to 31.00
Mixed cupola cast.	38.00 to 39.00
Automotive cast.	43.00 to 44.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	90.00 to 95.00
430 bundles and solids	95.00 to 100.00
410 turnings	20.00 to 25.00

## Boston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	21.00 to 22.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	27.00 to 28.00
Machine shop turn.	8.00 to 9.00
Mixed bor. and short turn.	8.00 to 9.00
Shoveling turnings	11.00 to 12.00
Clean cast. chem. borings	19.00 to 20.00
No. 1 machinery cast.	32.00 to 33.00
Mixed cupola cast.	32.00 to 33.00
Heavy breakable cast.	30.00 to 31.00
Stove plate	31.00 to 32.00
Unstripped motor blocks	22.00 to 23.00

## San Francisco

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	22.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 RR hvy. melting	32.00
No. 1 cupola cast.	45.00

## Los Angeles

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	\$27.00 to 28.00
No. 2 bundles	17.00
Machine shop turn.	11.00
Shoveling turnings	13.00
Cast iron borings	13.00
Elec. furn 1 ft and under (foundry)	43.00
No. 1 RR hvy. melting	33.00
No. 1 cupola cast.	42.00

## Seattle

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

## Hamilton, Ont.

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	26.00
No. 1 dealer bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Busheling	20.00
Bush., new fact., prep'd.	30.00
Bush., new fact., unprep'd	24.00
Machine shop turn.	15.00
Short steel turn.	19.00
Mixed bor. and turn.	15.00
Rails, rerolling	39.00
Cast scrap	\$39.00 to 41.00





See your AIM\*... Gunité Foundries does...

### Acme Steel Strapping unitizes vehicle parts

**GUNITE FOUNDRIES CORPORATION, ROCKFORD, ILL.,** found a way to improve arrival condition of precision vehicle parts. Together with their Acme Idea Man they worked out highly successful unitizing and palletizing methods, using heavy-duty Acme Steel Strapping tensioned with pneumatic tools. (Idea No. U6-19)

Example: Wheel and brake assemblies are unitized on pallets, and kept secure and stable in transit and during transfer between carriers, arriving at destination without damage. Both manufacturer and customer profit from maximum utilization of mechanical handling equipment. Additional time and effort are saved by Gunité through use of an Acme Steel Pneumatic Stretcher. Delivering a pre-determined tension, this tool takes strapping direct from the coil, eliminates waste and contributes to increased package output by reducing operator fatigue.

\*See your Acme Idea Man about your packaging problems. His solutions can result in safe arrival of your products, as well as savings in time and materials. Call him, at the Acme Steel office nearest you, or write Dept. IFU-98, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.

Acme Idea Man  
W. C. Saari solves  
strapping problems  
for Gunité Foundries  
and many other  
companies.



## STEEL STRAPPING

# Trade Is Optimistic For Last Quarter

**There's still plenty of unsold metal in producers' yards.**

**But latest reports indicate the worst is over.**

**Deliveries are picking up, and surpluses are starting to dwindle.**

■ There is plenty of optimism being generated in domestic nonferrous industries these days. Metal is still stacked pretty high in producers' yards. But there is definite justification for the brighter outlook.

Unsold stocks are starting to dwindle. The consensus is that while business is far from booming, there has been a definite improvement in sales. More people than not are looking for a good fourth quarter.

Some of the latest sources of optimism:

**Diecasters**—At its annual meeting the American Die Casting Institute predicted the total output of both custom and captive diecasters in 1958. It was optimistic considering the 40 pct drop in the first half of 1958 from the same period last year.

But the Institute pointed out sales slid to their lowest point in March, with the next three months "showing less drastic losses." A pickup is noted since. Many diecasters say the fourth quarter is sure to be far-and-away the best of the year.

The Institute figures output of aluminum diecastings this year will be about 315 million lb, off from 376.5 million lb in 1957. An addi-

tional 22 million lb will be used in alloying zinc diecastings.

Output of zinc diecastings in 1958 is predicted at 270,000 tons, compared to 351,000 tons in 1957.

**How Experts See It**—Donovan Wilmot, vice president, Alcoa, said he expected "fields for use of aluminum diecastings will continue to expand at an accelerated rate."

Charles R. Ince, vice president, St. Joseph Lead Co., told the group "the fourth quarter rate of zinc diecastings should be the highest for the year."

**Zinc**—The American Zinc Institute has some good news for the domestic industry. In August shipments were up, while smelters' unsold stocks were down. It wasn't much, but it's the first time this year smelters have been able to finish a month with less than they began with. And it's only the second time they were able to increase shipments over the previous month.

August shipments of 69,309 tons were a new high for the year. But it took a drop in production from 65,119 tons in July, to 62,927 in August to help bring down the surplus. Smelters finished August stuck with 251,529 tons of unsold metal. They began the month with 257,911 tons.

**Copper**—What the Copper Institute had to say about August business was also encouraging. Domestic producers took the biggest bite out of their unsold stocks in the last two years. They finished August with 27,221 fewer tons of metal on hand than they began with. They dropped to 215,560 tons from 242,781 tons of copper unsold at the end of July.

Deliveries were up to 86,982 tons from 77,523 tons in July. But refined production dropped to the lowest point of the year—100,640 tons.

## Nickel

International Nickel Co. began this week with the threat of a strike that would halt all Canadian production. The Mine, Mill and Smelter Workers have rank-and-file authority to call a strike.

**Sore Point**—The main hassle is over wages. The union is asking a 10 pct hike. The company contends that the drop in sales and the large unsold stocks of metal do not warrant an increase.

A conciliation board decision favored the company position. But a minority favored some increase.

The union wants to reopen negotiations based on the minority view. The company says it is willing to talk. But it appeared no sessions would be held this week.

An observer suggested the union would probably not call workers out at least until they made one more try at a peaceful settlement.

Tin prices for the week: Sept. 10—95.00; Sept. 11—95.25; Sept. 12—95.625; Sept. 15—95.625; Sept. 16—95.625.\*

\* Estimate.

## Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.75	24.00	8/1/58
Aluminum ingot	26.00	26.10	8/1/58
Copper (E)	29.50	29-28.00	7/17/58
Copper (CS)	26.25	26.00	9/4/58
Copper (L)	29.50	28.00	7/17/58
Lead, St. L.	10.55	10.00	8/13/58
Lead, N. Y.	10.75	10.75	8/13/58
Magnesium ingot	36.00	34.00	8/13/58
Magnesium pig	36.25	33.75	8/13/58
Nickel	74.00	84.50	12/6/56
Titanium sponge	185-205	200-250	4/1/58
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.00	11.00	7/1/57

**ALUMINUM:** 99% ingot frt allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **TIN:** see above; other primary prices, pg. 144.



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*"run of the mill"*  
*always means*  
**Brass at its Best**



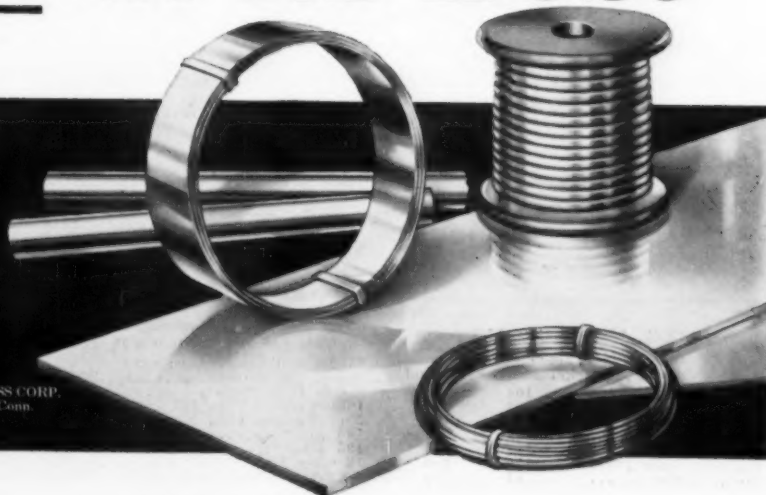
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 ROD AND WIRE IN  
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and for BRASS FORGINGS, LTD., ACCURATE BRASS CORP.  
 (Subsidiary of The Bristol Brass Corp., Bristol, Conn.)



# NONFERROUS PRICES

## MILL PRODUCTS

(Cents per lb unless otherwise noted)

### ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

#### Flat Sheet (Mill Finish and Plate)

("P" temper except 6061-0)

Alloy	.002	.001	.138- 249	.250- 3
1100, 3003.....	45.7	43.8	42.8	43.3
5052.....	53.1	45.4	46.9	46.0
6061-0.....	50.1	45.7	43.9	44.0

#### Extruded Solid Shapes

Factor	6063 T-5	6063 T-6
6-8.....	42.7-44.2	51.1-54.8
12-14.....	42.7-44.2	52.0-56.5
24-26.....	43.2-44.7	52.8-57.5
36-38.....	46.7-49.3	58.9-60.6

#### Screw Machine Stock—2011-T-3

Size"	3/4	3/4-1/2	1/2-1	1 1/4-1 1/2
Price.....	62.0	61.2	60.7	57.3

#### Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"	72	96	120	144
.010 gage.....	\$1.411	\$1.884	\$2.353	\$2.823
.024 gage.....	1.783	2.340	2.937	3.524

## MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

#### Sheet and Plate

Type→	Gage→	.250 3.00	.250 2.00	.168	.061	.003
AZ31B Stand, Grade.....		67.9	69.0	77.9	108.1	
AZ31B Spec.....		93.3	95.7	108.7	171.3	
Tread Plate.....		70.6	71.7			
Tooling Plate.....	73.0					

#### Extruded Shapes

factor→	6-8	12-14	24-26	30-38
Comm. Grade.. (AZ31C).....	69.6	70.7	75.6	89.3
Spec. Grade... (AZ31B).....	84.6	85.7	90.6	104.3

#### Alloy Ingot

AZ91B (Die Casting)..... 37.25 (delivered)  
AZ63A, AZ63A, AZ91C (Sand Casting) 40.75 (Volasco, Tex.)

## NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

"A" Nickel Monel Inconel

	126	106	128
Sheet, CR.....	124	108	138
Rod, bar, HR.....	107	89	109
Angles, HR.....	107	89	109
Plates, HR.....	120	105	121
Seamless tube.....	157	129	200
Shot, blocks.....		87	

## COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper.....	49.03	46.86	46.89	
Brass, 70/30.....	43.87	44.11	43.51	46.45
Brass, Low.....	46.03	46.57	45.97	48.84
Brass, R L.....	46.89	47.43	46.83	49.70
Brass, Naval.....	47.53	42.14	51.24	
Muntz Metal.....	45.95	41.76		
Comm. Br.....	48.30	48.84	48.24	50.86
Mang. Br.....	51.57	45.67		
Phos. Br. 5%.....	58.59	59.09		

Free Cutting Brass Rod..... 29.28

## TITANIUM

(Base prices, f.o.b. mill)

Sheet and strip, commercially pure, \$8.50-\$10.10; alloy, \$15.95; Plate, HR, commercially pure, \$6.00-\$6.75; alloy, \$8.75-\$9.50. Wire, rolled and/or drawn, commercially pure, \$6.50-\$7.00; alloy, \$10.00-\$11.50; Bar, HR or forged, commercially pure, \$5.25-\$5.50; alloy, \$5.25-\$6.35; billets, HR, commercially pure, \$4.10-\$4.35; alloy, \$4.10-\$4.20.

## PRIMARY METAL

(Cents per lb unless otherwise noted)  
Antimony, American, Laredo, Tex., 29.50  
Beryllium aluminum 5% Be, Dollar  
per lb contained Be..... \$74.75  
Beryllium copper, per lb conta'd Be..... \$43.00  
Beryllium 97% lump or beads,  
f.o.b. Cleveland, Reading..... \$71.50  
Bismuth, ton lots..... \$ 2.25  
Cadmium, del'd..... \$ 1.55  
Calcium, 99.9% small lots..... \$ 4.55  
Chromium, 99.8% metallic basis..... \$ 1.31  
Cobalt, 97-99% (per lb)..... \$2.00 to \$2.07  
Germanium, per gm, f.o.b. Miami,  
Okla., refined..... \$39.50 to \$50.00  
Gold, U. S. Treas., per troy oz..... \$35.00  
Indium, 99.9%, dollars per troy oz..... \$ 2.25  
Iridium, dollars per troy oz..... \$70 to \$80  
Lithium, 98%..... \$11.00 to \$14.00  
Magnesium, sticks, 100 to 500 lb..... 59.00  
Mercury, dollars per 76-lb flask,  
f.o.b. New York..... \$240 to \$244  
Nickel oxide sinter at Buffalo, N. Y.,  
or other U. S. points of entry,  
contained nickel..... 69.60  
Palladium, dollars per troy oz..... \$15 to \$17  
Platinum, dollars per troy oz..... \$58 to \$65  
Rhodium..... \$120.00 to \$125.00  
Silver ingots (per troy oz.)..... \$8.625  
Thorium, per kg..... \$43.00  
Vanadium..... \$ 3.45  
Zirconium sponge..... \$ 5.00

## REMELTED METALS

### Brass Ingot

(Cents per lb delivered, carloads)  
85-5-5 ingot..... 27.00  
No. 115..... 26.25  
No. 120..... 26.25  
No. 123..... 25.75  
80-10-10 ingot..... 31.25  
No. 305..... 29.25  
No. 315..... 38.25  
88-10-2 ingot..... 34.00  
No. 210..... 30.75  
No. 215..... 22.75  
Yellow ingot..... 24.50  
No. 405..... 24.50  
Manganese bronze..... 24.50  
No. 421..... 24.50

### Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)  
95-5 aluminum-silicon alloys..... 24.75-25.00  
0.30 copper max..... 24.50-24.75  
0.60 copper max..... 24.50-24.75  
Piston alloys (No. 122 type)..... 24.25-25.25  
No. 12 alum. (No. 2 grade)..... 21.50-22.00  
108 alloy..... 22.00-22.50  
195 alloy..... 25.00-26.00  
13 alloy (0.60 copper max.)..... 24.25-24.75  
AXS-679 (1 pct zinc)..... 21.75-22.25

(Effective Sept. 15, 1958)

Steel deoxidizing aluminum notch bar  
granulated or shot

Grade 1—95-97 1/2%.....	22.50-23.50
Grade 2—92-95%.....	21.25-22.25
Grade 3—90-92%.....	20.25-21.25
Grade 4—88-90%.....	17.50-18.50

## SCRAP METALS

### Brass Mill Scrap

(Cents per pound, add 1¢ per lb for  
shipments of 20,000 lb and over)

	Heavy	Turnings
Copper.....	22 1/2	21 3/4
Yellow brass.....	17	15 3/4
Red brass.....	19 3/4	19
Comm. bronze.....	20 3/4	19 3/4
Mang. bronze.....	15 3/4	14 3/4
Yellow brass rod ends.....	16 3/4	

### Customs Smelters Scrap

(Cents per pound carload lots, delivered  
to refinery)

No. 1 copper wire.....	22 1/4
No. 2 copper wire.....	20 3/4
Light copper.....	18 1/2
Light copper.....	18 1/2
*Refinery brass.....	20 1/4
Copper bearing material.....	18 1/2
* Dry copper content.	

### Ingot Makers Scrap

(Cents per pound carload lots, delivered  
to refinery)

No. 1 copper wire.....	22 1/4
No. 2 copper wire.....	20 3/4
Light copper.....	18 1/2
No. 1 composition.....	18 1/2
No. 1 comp. turnings.....	13 1/2
Hvy. yellow brass solids.....	13 1/2
Brass pipe.....	15
Radiators.....	15
Aluminum.....	
Mixed old cast.....	12 — 12 1/2
Mixed new clips.....	15 — 16
Mixed turnings, dry.....	13 — 14

### Dealers' Scrap

(Dealers' buying price f.o.b. New York  
in cents per pound)

	Copper and Brass
No. 1 copper wire.....	19 1/4 — 19 3/4
No. 2 copper wire.....	17 1/4 — 17 3/4
Light copper.....	15 1/4 — 15 3/4
Auto radiators (unsweated).....	11 1/2 — 12
No. 1 composition.....	15 1/2 — 16
No. 1 composition turnings.....	14 1/2 — 15
Cocks and faucets.....	12 1/2 — 13
Clean heavy yellow brass.....	10 3/4 — 11 1/4
Brass pipe.....	12 1/2 — 13 1/4
New soft brass clippings.....	13 1/4 — 13 3/4
No. 1 brass rod turnings.....	10 3/4 — 11 1/4

### Aluminum

Alum. pistons and struts.....	5 1/4 — 5 3/4
Aluminum crankcases.....	9 1/4 — 9 3/4
1100 (2S) aluminum clippings.....	12 1/2 — 13 1/4
Old sheet and utensils.....	9 1/4 — 9 3/4
Borings and turnings.....	6 1/4 — 6 3/4
Industrial castings.....	9 1/4 — 9 3/4
2024 (24S) clippings.....	10 3/4 — 11 1/4

### Zinc

New zinc clippings.....	4 — 4 1/2
Old zinc.....	3 — 3 1/4
Zinc routings.....	1 3/4 — 2
Old die cast scrap.....	1 1/2 — 1 3/4

### Nickel and Monel

Pure nickel clippings.....	52-54
Clean nickel turnings.....	37-40
Nickel anodes.....	52-54
Nickel rod ends.....	52-54
New Monel clippings.....	30-32
Clean Monel turnings.....	30-32
Old sheet Monel.....	26-28
Nickel silver clippings, mixed.....	18
Nickel silver turnings, mixed.....	15

### Lead

Soft scrap lead.....	6 1/4 — 6 3/4
Battery plates (dry).....	2 — 2 1/4
Batteries, acid free.....	1 1/2 — 1 3/4

### Miscellaneous

Block tin.....	75 — 76
No. 1 pewter.....	59 — 60
Auto babbitt.....	39 — 40
Mixer common babbitt.....	9 1/4 — 10
Solder joints.....	13 1/4 — 13 3/4
Siphon tops.....	42
Small foundry type.....	10 1/4 — 10 3/4
Monotype.....	10 1/4 — 10 3/4
Lino. and stereotype.....	9 1/4 — 9 3/4
Electrotype.....	8 1/4 — 8 3/4
Hand picked type shells.....	6 1/4 — 6 3/4
Lino. and stereo, dross.....	2 1/4 — 2 3/4
Electro dross.....	1 3/4 — 2





Doorknobs are more than door openers, today. They're bold, glittering accessories. And VOLCO has had a big hand in making them big business. Alert manufacturers count on VOLCO brass for the quality and finish that are important to this new decorative look . . . for the durability that is essen-

tial to any door hardware. Whatever your product — keys, strike plates, knobs, locks . . . VOLCO's long and diversified experience supplying the right strip will unlock new doors, new profits for you. And remember . . . "Volco is the supplier who is not your competitor."



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## IRON AGE

*Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.***STEEL  
PRICES****BILLETS, BLOOMS,  
SLABS****PIL-  
ING****SHAPES  
STRUCTURALS****STRIP**Carbon  
Re-rolling  
Net TonCarbon  
Forging  
Net TonAlloy  
Net TonSheet  
Steel

Carbon

Hi Str.  
Low  
AlloyCarbon  
Wide  
FlangeHot-  
rolledCold-  
rolledHi Str.  
H.R. Low  
AlloyHi Str.  
C.R. Low  
AlloyAlloy  
Hot-  
rolledAlloy  
Cold-  
rolled

EAST	Bethlehem, Pa.			\$119.00 B3		5.55 B3	8.10 B3	5.55 B5						
	Buffalo, N. Y.	\$80.00 R3, B3	\$99.50 R3, B3	\$119.00 R3, B3	6.50 B3	5.55 B3	8.10 B3	5.55 B3	5.10 B3, R3	7.425 S10, R7	7.575 B3			
	Phila., Pa.									7.875 P15				
	Harrison, N. J.												15.55 C11	
	Conschocken, Pa.		\$104.50 A2	\$126.00 A2					5.15 A2		7.575 A2			
	New Bedford, Mass.									7.875 R6				
	Johnstown, Pa.	\$80.00 B3	\$99.50 B3	\$119.00 B3		5.55 B3	8.10 B3							
	Boston, Mass.									7.975 T8				
	New Haven, Conn.									7.875 D1				
	Baltimore, Md.									7.425 T8			15.90 T8	
	Phoenixville, Pa.					5.55 P2		5.55 P2						
MIDDLE WEST	Sparrows Pt., Md.								5.10 B3		7.575 B3			
	New Britain, Bridgeport, Wallingford, Conn.			\$119.00 N8						7.875 W1,S7				
	Pawtucket, R. I. Worcester, Mass.									7.975 N7, A5			15.90 N7 15.70 T8	
	Alton, Ill.								5.30 L1					
	Ashland, Ky.								5.10 A7		7.575 A7			
	Canton-Massillon, Dover, Ohio		\$102.00 R3	\$119.00 R3, \$114.00 T3						7.425 G4		10.80 G4	15.50 C11	
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	\$80.00 U1, R3	\$99.50 U1, R3,W8	\$119.00 U1, R3,W8	6.50 U1	5.50 U1, W8,P13	8.05 U1, Y1,W8	5.50 U1	5.10 W8, N4,A1	7.525 A1,T8, M8	7.575 W8		8.40 W8, S9,I3	15.55 A1, S9,G4,T8
	Cleveland, Ohio									7.425 A5,J3		10.75 A5	8.40 J3	
	Detroit, Mich.			\$119.00 R5					5.10 G3, M2	7.425 M2, D1,D2,P11	7.575 G3	10.80 D2		
	Anderson, Ind.									7.425 G4				
	Gary, Ind. Harbor, Indiana	\$80.00 U1	\$99.50 U1	\$119.00 U1, Y1		5.50 U1, I3	8.05 U1, J3	5.50 I3	5.10 U1, I3,Y1	7.425 Y1	7.575 U1, I3,Y1	10.90 Y1	8.40 U1, Y1	
WEST	Sterling, Ill.	\$80.00 N4				5.50 N4			5.20 N4					
	Indianapolis, Ind.									7.575 R5			15.70 R5	
	Newport, Ky.								5.10 A9				8.40 A9	
	Niles, Warren, Ohio Sharon, Pa.		\$99.50 S1, C10	\$119.00 C10,S1					5.10 R3, S1	7.425 R3, T4,S1	7.575 R3, S1	10.80 S1 R3	8.40 S1	15.55 S1
	Owensboro, Ky.	\$80.00 G5	\$99.50 G5	\$119.00 G5										
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	\$80.00 U1, P6	\$99.50 U1, C11,P6	\$119.00 U1, C11,B7	6.50 U1	5.50 U1, J3	8.05 U1, J3	5.50 U1	5.10 P6	7.425 J3,B4			8.40 S9	15.55 S9
	Weirton, Wheeling, Follansbee, W. Va.				6.50 U1, W3	5.50 W3		5.50 W3	5.10 W3	7.425 W3,F3	7.575 W3	10.80 W3		
	Youngstown, Ohio	\$80.00 R3	\$99.50 Y1, C10	\$119.00 Y1			8.05 Y1		5.10 U	7.425 Y1,R5	7.575 U1, Y1	10.95 Y1	8.40 U1, Y1	15.55 R5, Y1
	Fontana, Cal.	\$90.50 K1	\$109.00 K1	\$140.00 K1		6.30 K1	8.85 K1	6.45 K1	5.85 K1	9.275 K1				
	Geneva, Utah		\$99.50 C7			5.50 C7	8.05 C7							
	Kansas City, Mo.					5.60 S2	8.15 S2						8.65 S2	
SOUTH	Los Angeles, Torrance, Cal.		\$109.00 B2	\$139.00 B2		6.20 C7, B2	8.75 B2		5.85 C7, B2	9.325 J3 9.30 C1			9.60 B2	17.75 J3
	Minnequa, Colo.					5.80 C6			6.20 C6	9.375 C6				
	Portland, Ore.					6.25 O2								
	San Francisco, Niles, Pittsburg, Cal.		\$109.00 B2			6.15 B2	8.70 B2		5.85 C7, B2					
	Seattle, Wash.		\$113.00 B2			6.25 B2	8.80 B2		6.10 B2					
	Atlanta, Ga.					5.70 A8			5.10 A8					
	Fairfield, Ala. City, Birmingham, Ala.	\$80.00 T2	\$99.50 T2			5.50 T2 R3,C16	8.05 T2		5.10 T2, R3,C16		7.575 T2			
	Houston, Lone Star, Texas		\$104.50 S2	\$124.00 S2		5.60 S2	8.15 S2						8.65 S2	

(Effective Sept. 15, 1958)

## IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL  
PRICES

STEEL PRICES		SHEETS							WIRE ROD	TINPLATE†		BLACK PLATE		
		Hot-rolled 18 ga. & hvyr.	Cold- rolled	Galvanized (Hot-dipped)	Enamel- ing	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.	
EAST	Buffalo, N. Y.	5.10 B3	6.275 B3				7.525 B3	9.275 B3		6.40 W6	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct \$2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.00. Differ- ential 1.00 lb. 0.25 lb. add 65¢.			
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	5.15 A2	6.325 A2				7.575 A2							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.								6.40 B3					
	Fairless, Pa.	5.15 U1	6.325 U1				7.575 U1	9.775 U1			\$10.15 U1	\$8.85 U1		
	New Haven, Conn.													
	Phoenixville, Pa.													
Sparrows Pt., Md.	5.10 B3	6.275 B3	6.875 B3			7.525 B3	9.275 B3	10.025 B3	6.50 B3	\$10.15 B3	\$8.85 B3			
Worcester, Mass.									6.70 A5					
Trenton, N. J.														
MIDDLE WEST	Alton, Ill.									6.60 L1				
	Ashland, Ky.	5.10 A7		6.875 A7	6.775 A7		7.525 A7							
	Canton-Massillon, Dover, Ohio			6.875 R1, R3										
	Chicago, Joliet, Ill.	5.10 W8, A1					7.525 U1, W8			6.40 A5, R3, W8				
	Sterling, Ill.									6.50 N4, K2				
	Cleveland, Ohio	5.10 R3, J3	6.275 R3, J3	7.65 R3*	6.775 R3		7.525 R3, J3	9.275 R3, J3		6.40 A5				
	Detroit, Mich.	5.10 G3, M2	6.275 G3, M2				7.525 G3	9.275 G3						
	Newport, Ky.	5.10 A1	6.275 A1											
	Gary, Ind. Harbor, Indiana	5.10 U1, I3, Y1	6.275 U1, I3, Y1	6.875 U1, I3	6.775 U1, I3, Y1	7.225 U1	7.525 U1, Y1, I3	9.275 U1, Y1		6.40 Y1	\$10.05 U1, Y1	\$8.75 I3, U1, Y1	7.50 U1, Y1	
	Granite City, Ill.	5.20 G2	6.375 G2	6.975 G2	6.875 G2							\$8.85 G2	7.60 G2	
	Kokomo, Ind.			6.975 C9						6.50 C9				
	Mansfield, Ohio	5.10 E2	6.275 E2			7.225 E2								
	Middletown, Ohio		6.275 A7	6.875 A7	6.775 A7	7.225 A7								
	Niles, Warren, Ohio Sharon, Pa.	5.10 R3, N3, S1	6.275 R3	6.875 R3 7.65 R3*	6.775 N3, S1	7.225 N3, S1*, R3	7.525 R3, S1	9.275 S1, R3				\$8.75 R3		
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa. Aliquippa, Pa.	5.10 U1, J3, P6	6.275 U1, J3, P6	6.875 U1, J3	6.775 U1		7.525 U1, J3	9.275 U1, J3	10.025 U1, J3	6.40 A5, J3, P6	\$10.05 W5, J3	\$8.75 U1, J3	7.50 U1, J3	
	Portsmouth, Ohio	5.10 P7	6.275 P7							6.40 P7				
	Weirton, Wheeling, Follansbee, W. Va.	5.10 W3, W5	6.275 W3, F3, W5	6.875 W3, W5 7.50 W3*		7.225 W3, W5	7.525 W3	9.275 W3			\$10.05 W5, W3	\$8.75 W5, W3	7.50 W5	
Youngstown, Ohio	5.10 U1, Y1	6.275 Y1	7.50 J3*	6.775 Y1		7.525 Y1	9.275 Y1		6.40 Y1					
WEST	Fontana, Cal.	5.85 K1	7.525 K1				8.275 K1	10.575 K1			\$10.80 K1	\$9.50 K1		
	Geneva, Utah	5.20 C7												
	Kansas City, Mo.									6.65 S2				
	Los Angeles, Torrance, Cal.									7.20 B2				
	Minnequa, Colo.									6.65 C6				
	San Francisco, Niles, Pittsburg, Cal.	5.80 C7	7.225 C7	7.625 C7						7.20 C7	\$10.80 C7	\$9.50 C7		
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	5.10 T2, R3	6.275 T2, R3	6.875 T2, R3	6.775 T2					6.40 T2, R3	\$10.15 T2	\$8.85 T2		
	Houston, Texas									6.65 S2				

\* Electrogalvanized sheets.

(Effective Sept. 15, 1958)

\*7.425 at Sharon-Niles is 7.225

## IRON AGE

STEEL  
PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 B3	9.025 B3	8.30 B3					
	Buffalo, N. Y.	5.675 R3,B3	5.675 R3,B3	7.70 B5	6.725 B3,R3	9.025 B3,B3	8.30 B3	5.30 B3				8.00 W6
	Claymont, Del.							5.30 C4		7.50 C4	7.95 C4	
	Coatesville, Pa.							5.30 L4		7.50 L4	7.95 L4	
	Conschocken, Pa.							5.30 A2	6.375 A2	7.50 A2	7.95 A2	
	Harrisburg, Pa.							5.30 P2	6.475 P2			
	Milton, Pa.	5.825 M7	5.825 M7									
	Hartford, Conn.			8.15 R3		9.325 R3						
	Johnstown, Pa.	5.675 B3	5.675 B3		6.725 B3		8.30 B3	5.30 B3		7.50 B3	7.95 B3	8.00 B3
	Fairless, Pa.	5.825 U1	5.825 U1		6.875 U1							
	Newark, N. J. Camden, N. J.			8.10 W10, P10		9.20 W10, P10						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 W10 8.15 J3	6.80 N8	9.175 N8						
	Sparrows Pt., Md.		5.675 B3					5.30 B3		7.50 B3	7.95 B3	8.10 B3
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			8.20 B5, C14		9.325 A5,B5						8.30 A5, W6
	Spring City, Pa.			8.10 K4		9.20 K4						
MIDDLE WEST	Alton, Ill.	5.875 L1										8.20 L1
	Ashland,Newport,Ky.							5.30 A7,A9		7.50 A9	7.95 A7	
	Canton, Massillon, Mansfield, Ohio	6.15* R3		7.65 R3,R2	6.725 R3 6.475 T5	9.025 R3,R2 8.775 T5	5.30 E2					
	Chicago, Joliet, Waukegan, Ill. Harvey, Ill.	5.675 U1,R3, W8,N4,P13	5.675 U1,R3, N4,P13,W8	7.65 A5, W10,W8, B5,L2,N9	6.725 U1,R3, W8	9.025 A5, W10,W8, L2,N8,B5	8.30 U1,W8, R3	5.30 U1,A1, W8,I3	6.375 U1	7.50 U1, W8	7.95 U1, W8	8.00 A5,R3, W8,N4, K2,W7
	Cleveland, Ohio Elyria, Ohio	5.675 R3	5.675 R3	7.65 A5,C13, C18		9.025 A5, C13,C18	8.30 R3	5.30 R3,J3	6.375 J3		7.95 R3,J3	8.00 A5, C13,C18
	Detroit, Mich.	5.675 G3	5.675 G3	7.90 P3 7.85 P8,B5 7.65 R5	6.725 R5,G3	9.025 R5 9.225 B5,P3, P8	8.30 G3	5.30 G3		7.50 G3	7.95 G3	
	Duluth, Minn.											8.00 A5
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 U1,I3, Y1	5.675 U1,I3, Y1	7.65 R3,J3	6.725 U1,I3, Y1	9.025 R3,M4	8.30 U1,Y1	5.30 U1,I3, Y1	6.375 J3, I1	7.50 U1, Y1	7.95 U1, Y1,I3	8.10 M4
	Granite City, Ill.							5.40 G2				
	Kokomo, Ind.		5.775 C9									8.10 C9
	Sterling, Ill.	5.775 N4	5.775 N4					5.30 N4				8.10 K2
	Niles, Warren, Ohio Sharon, Pa.			7.65 C10	6.725 C10,S1	9.025 C10	7.925 S1	5.30 R3,S1		7.50 S1	7.95 R3, S1	
	Owensboro, Ky.	5.675 G5			6.725 G5							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 U1,J3	5.675 U1,J3	7.65 A5,B4, R3,J3,C11, W10,S9,C8, M9	6.725 U1,J3, C11,B7	9.025 A5, W10,R3,S9, C11,C8,M9	8.30 U1,J3	5.30 U1,J3	6.375 U1	7.50 U1, J3,B7	7.95 U1, J3,B7	8.00 A5, J3,P6
	Portsmouth, Ohio											8.00 P7
Weirton, Wheeling, Follansbee, W. Va.							5.30 W5					
Youngstown, Ohio	5.675 U1,R3, Y1	5.675 U1,R3, Y1	7.65 A1,Y1, F2	6.725 U1,Y1	9.025 Y1,F2	8.30 U1,Y1	5.30 U1, R3,Y1		7.50 Y1	7.95 U1,Y1	8.00 Y1	
WEST	Emeryville, Cal. Fontana, Cal.	6.425 J5 6.375 K1	6.425 J5 6.375 K1		7.775 K1		8.625 K1	6.10 K1		8.30 K1	8.75 K1	
	Geneva, Utah							5.30 C7			7.95 C7	
	Kansas City, Mo.	5.925 S2	5.925 S2		6.975 S2		8.55 S2					8.25 S2
	Los Angeles, Torrance, Cal.	6.375 C7,B2	6.375 C7,B2	9.10 R3,P14, S12	7.775 B2	11.00 P14, S12	8.625 B2					8.95 B2
	Minnequa, Colo.	6.125 C6	6.125 C6					6.15 C6				8.25 C6
	Portland, Ore.	6.425 O2	6.425 O2									
	San Francisco, Niles, Pittsburg, Cal.	6.375 C7 6.425 B2	6.375 C7 6.425 B2				8.675 B2					8.95 C7,C6
	Seattle, Wash.	6.425 B2,N6	6.425 B2				8.675 B2	6.20 B2		8.40 B2	8.95 B2	
	Atlanta, Ga.	5.875 A8	5.675 A8									8.00 A8
	Fairfield, Ala. City, Birmingham, Ala.	5.675 T2,R3, C16	5.675 T2,R3, C16	8.25 C16			8.30 T2	5.30 T2,R3			7.95 T2	8.00 T2,R3
SOUTH	Houston, Ft. Worth, Lone Star, Texas	5.925 S2	5.925 S2		6.975 S2		8.55 S2	5.40 S2		7.60 S2	8.05 S2	8.25 S2

† Merchant Quality—Special Quality 35¢ higher.

(Effective Sept. 15, 1958)

\* Special Quality.

THE IRON AGE, September 18, 1958



# STEEL PRICES

## Key to Steel Producers

### With Principal Offices

- A1 Acme Steel Co., Chicago  
A2 Alan Wood Steel Co., Conshohocken, Pa.  
A3 Allegheny Ludlum Steel Corp., Pittsburgh  
A4 American Cladmetals Co., Carnegie, Pa.  
A5 American Steel & Wire Div., Cleveland  
A6 Angel Nail & Chaplet Co., Cleveland  
A7 Armco Steel Corp., Middletown, Ohio  
A8 Atlantic Steel Co., Atlanta, Ga.  
A9 Acme-Newport Steel Co., Newport, Ky.  
B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.  
B2 Bethlehem Pacific Coast Steel Corp., San Francisco  
B3 Bethlehem Steel Co., Bethlehem, Pa.  
B4 Blair Strip Steel Co., New Castle, Pa.  
B5 Bliss & Laughlin, Inc., Harvey, Ill.  
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.  
B7 A. M. Byers, Pittsburgh  
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.  
C1 Calstrip Steel Corp., Los Angeles  
C2 Carpenter Steel Co., Reading, Pa.  
C3 Central Iron & Steel Co., Harrisburg, Pa.  
C4 Claymont Products Dept., Claymont, Del.  
C6 Colorado Fuel & Iron Corp., Denver  
C7 Columbia Geneva Steel Div., San Francisco  
C8 Columbia Steel & Shafting Co., Pittsburgh  
C9 Continental Steel Corp., Kokomo, Ind.  
C10 Copperweld Steel Co., Pittsburgh, Pa.  
C11 Crucible Steel Co. of America, Pittsburgh  
C13 Cuyahoga Steel & Wire Co., Cleveland  
C14 Compressed Steel Shafting Co., Readville, Mass.  
C15 G. O. Carlson, Inc., Thorndale, Pa.  
C16 Connors Steel Div., Birmingham  
C17 Chester Blast Furnace, Inc., Chester, Pa.  
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.  
D1 Detroit Steel Corp., Detroit  
D2 Dearborn Div., Sharon Steel Corp.  
D3 Driver Harris Co., Harrison, N. J.  
D4 Dickson Weatherproof Nail Co., Evanston, Ill.  
E1 Eastern Stainless Steel Corp., Baltimore  
E2 Empire Reeves Steel Corp., Mansfield, O.  
F1 Firth Sterling, Inc., McKeesport, Pa.  
F2 Fitzsimons Steel Corp., Youngstown  
F3 Follansbee Steel Corp., Follansbee, W. Va.

- G2 Granite City Steel Co., Granite City, Ill.  
G3 Great Lakes Steel Corp., Detroit  
G4 Greer Steel Co., Dover, O.  
G5 Green River Steel Corp., Owenboro, Ky.  
H1 Hanna Furnace Corp., Detroit  
H2 Ingersoll Steel Div., Chicago  
H3 Inland Steel Co., Chicago  
H4 Interlake Iron Corp., Cleveland  
J1 Jackson Iron & Steel Co., Jackson, O.  
J2 Jessop Steel Corp., Washington, Pa.  
J3 Jones & Laughlin Steel Corp., Pittsburgh  
J4 Joslyn Mfg. & Supply Co., Chicago  
J5 Judson Steel Corp., Emeryville, Calif.  
K1 Kaiser Steel Corp., Fontana, Calif.  
K2 Keystone Steel & Wire Co., Peoria  
K3 Koppers Co., Granite City, Ill.  
K4 Keystone Drawn Steel Co., Spring City, Pa.  
L1 Laclede Steel Co., St. Louis  
L2 La Salle Steel Co., Chicago  
L3 Lone Star Steel Co., Dallas  
L4 Lukens Steel Co., Coatesville, Pa.  
M1 Mahoning Valley Steel Co., Niles, O.  
M2 McLouth Steel Corp., Detroit  
M3 Mercer Tube & Mfg. Co., Sharon, Pa.  
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.  
M6 Mystic Iron Works, Everett, Mass.  
M7 Milton Steel Products Div., Milton, Pa.  
M8 Mill Strip Products Co., Evanston, Ill.  
M9 Moltrup Steel Products Co., Beaver Falls, Pa.  
N1 National Supply Co., Pittsburgh  
N2 National Tube Div., Pittsburgh  
N3 Niles Rolling Mill Div., Niles, O.  
N4 Northwestern Steel & Wire Co., Sterling, Ill.  
N6 Northwest Steel Rolling Mills, Seattle  
N7 Newman Crosby Steel Co., Pawtucket, R. I.  
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.  
N9 Nelson Steel & Wire Co.  
O1 Oliver Iron & Steel Co., Pittsburgh  
O2 Oregon Steel Mills, Portland  
P1 Page Steel & Wire Div., Monessen, Pa.  
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.  
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.  
P4 Pittsburgh Coke & Chemical Co., Pittsburgh  
P5 Pittsburgh Screw & Bolt Co., Pittsburgh  
P6 Pittsburgh Steel Co., Pittsburgh  
P7 Portsmouth Div., Detroit Steel Corp., Detroit

- P8 Plymouth Steel Co., Detroit  
P9 Pacific States Steel Co., Niles, Cal.  
P10 Precision Drawn Steel Co., Camden, N. J.  
P11 Production Steel Strip Corp., Detroit  
P13 Phoenix Mfg. Co., Joliet, Ill.  
P14 Pacific Tube Co.  
P15 Philadelphia Steel and Wire Corp.  
R1 Reeves Steel & Mfg. Co., Dover, O.  
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.  
R3 Republic Steel Corp., Cleveland  
R4 Roebling Sons Co., John A., Trenton, N. J.  
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.  
R6 Rodney Metals, Inc., New Bedford, Mass.  
R7 Rome Strip Steel Co., Rome, N. Y.  
S1 Sharon Steel Corp., Sharon, Pa.  
S2 Sheffield Steel Div., Kansas City  
S3 Shenango Furnace Co., Pittsburgh  
S4 Simonds Saw and Steel Co., Fitchburg, Mass.  
S5 Sweet's Steel Co., Williamsport, Pa.  
S7 Stanley Works, New Britain, Conn.  
S8 Superior Drawn Steel Co., Monaca, Pa.  
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.  
S10 Seneca Steel Service, Buffalo  
S11 Southern Electric Steel Co., Birmingham  
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.  
T1 Tonawanda Iron Div., N. Tonawanda, N. Y.  
T2 Tennessee Coal & Iron Div., Fairfield  
T3 Tennessee Products & Chem. Corp., Nashville  
T4 Thomas Strip Div., Warren, O.  
T5 Timken Steel & Tube Div., Canton, O.  
T7 Texas Steel Co., Fort Worth  
T8 Thompson Wire Co., Boston  
U1 United States Steel Corp., Pittsburgh  
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.  
U3 Ulbrich Stainless Steels, Wallingford, Conn.  
U4 U. S. Pipe & Foundry Co., Birmingham  
W1 Wallingford Steel Co., Wallingford, Conn.  
W2 Washington Steel Corp., Washington, Pa.  
W3 Weirton Steel Co., Weirton, W. Va.  
W4 Wheatland Tube Co., Wheatland, Pa.  
W5 Wheeling Steel Corp., Wheeling, W. Va.  
W6 Wickwire Spencer Steel Div., Buffalo  
W7 Wilson Steel & Wire Co., Chicago  
W8 Wisconsin Steel Div., S. Chicago, Ill.  
W9 Woodward Iron Co., Woodward, Ala.  
W10 Wyckoff Steel Co., Pittsburgh  
W12 Wallace Barnes Steel Div., Bristol, Conn.  
Y1 Youngstown Sheet & Tube Co., Youngstown, O.

## PIPE AND TUBING

Base discounts (pt) f.o.b. mills. Base price about \$200 per net ton.

	BUTTWELD																SEAMLESS							
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2-3 In.		2 In.		2 1/2 In.		3 In.		3 1/2-4 In.			
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.		
STANDARD T. & C.																								
Sparrows Pt. B3	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Youngstown R3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Fontana K1	*10.75	*28.00	*7.75	*22.00	*4.25	*17.00	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50										
Pittsburgh J3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
Alton, Ill. L1	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Sharon M3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Fairless N2	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50										
Pittsburgh N1	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
Wheeling W5	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Wheatland W4	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50										
Youngstown Y1	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
Indiana Harbor Y1	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50										
Lorain N2	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50		
EXTRA STRONG PLAIN ENDS																								
Sparrows Pt. B3	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Youngstown R3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Fairless N2	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Fontana K1	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75											
Pittsburgh J3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Alton, Ill. L1	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50										
Sharon M3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Pittsburgh N1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Wheeling W5	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Wheatland W4	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50										
Youngstown Y1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		
Indiana Harbor Y1	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50										
Lorain N2	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50		

Threads only, butt weld and seamless, 2 1/4 pt. higher discount. Plain ends, butt weld and seamless, 3-in. and under, 5 1/2 pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2 1/2 and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

(Effective Sept. 15, 1958)

## TOOL STEEL

F.o.b. mill	W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	—	\$1.84	T-1
18	4	1	—	—	5	2.545	T-4
18	4	2	—	—	—	2.005	T-2
1.5	4	1.5	8	—	—	1.20	M-1
6	4	2	—	—	—	1.59	M-3
6	4	2	5	—	—	1.345	M-2
High-carbon chromium...							.955 D-3, D-5
Oil hardened manganese							.505 O-2
Special carbon							.38 W-1
Extra carbon							.38 W-1
Regular carbon							.325 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

## CLAD STEEL

Base prices, cents per lb f.o.b.

Cladding	Plate (L4, C4, A3, J2)				Sheet (J2)
	10 pct	15 pct	20 pct	20 pct	
302					37.50
304	28.80	31.55	34.30	40.00	
316	42.20	46.25	50.25	58.75	
321	34.50	37.75	41.05	47.25	
347	40.80	44.65	48.55	57.00	
405	24.60	28.90	29.25		
410	22.70	24.85	27.00		
430	23.45	25.65	27.90		

CR Strip (S9) Copper, 10 pct, 2 sides, 38.75; 1 side, 33.10.

## RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer U/I	5.75	6.725	7.25			15.35
Cleveland R3				10.10		
So. Chicago R3						
Ensley T2	5.75	6.725		10.10	6.875	
Fairfield T2	5.75	6.725			6.875	
Gary U/I		6.50		10.10		
Huntington C16						
Ind. Harbor Y1						
Johnstown B3		6.725				
Joliet U/I			7.25			
Kansas City S2				10.10		15.35
Lackawanna B3	5.75	6.725	7.25		6.875	
Lebanon B3		7.25				15.35
Minneapolis C6	5.525	7.00	6.975	10.10	6.60	14.75
Pittsburgh P5						14.75
Pittsburgh J3				10.10		
Seattle B2					6.75	15.85
Steelton B3	5.75		7.25		6.875	
Struthers Y1				10.10		
Terrace C7					6.75	
Williamport S5		6.50				
Youngstown R3				10.10		

## COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	\$14.50
Foundry, beehive (f.o.b.)	\$18.00 to \$18.50
Foundry oven coke	
Buffalo, del'd	\$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erle, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Ia., Pa.	29.25

## LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight changes for seller's account.	Gross Ton
Openhearth lump	\$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

## ELECTRICAL SHEETS

22-Gage	F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length)	
			Semi-Processed	Fully Processed
Field			9.875	
Armature	11.70	11.20	11.70	
Elect.	12.40	11.90	12.40	
Special Motor		12.475		
Motor	13.55	13.05	13.55	
Dynamo	14.65	14.15	14.65	
Trans. 72	15.70	15.20	15.70	
Trans. 65	16.30			
Grain Oriented				
Trans. 58	16.80	Trans. 80	19.70	
Trans. 52	17.85	Trans. 73	20.20	
		Trans. 66	20.70	

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (A9); Niles, O. (N3); Vandergrift (U); Warren, O. (R3); Zanesville, Butler (A7).

## ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	26.00	40	100, 110	10.70
20	72	25.25	35	110	10.70
18	72	25.75	30	110	10.85
14	72	25.75	24	72 to 84	11.25
12	72	26.25	20	90	11.00
10	60	28.00	17	72	11.40
10	48	28.50	14	72	11.85
7	60	28.25	12	60	12.95
6	60	31.50	10	60	13.00
4	40	35.00	8	60	13.30
3	40	37.00			
2 1/2	30	39.25			
2	24	60.75			

\* Prices shown cover carbon nipples.

## REFRACTORIES

## Fire Clay Brick

Super duty, Mo., Pa., Md., Ky.	per 1000
High duty (except Salina, Pa., add \$5.00)	\$185.00
Medium duty	140.00
Low duty (except Salina, Pa., add \$2.00)	125.00
Ground fire clay, net ton, bulk	103.00
	22.50

## Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$158.00
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	163.00
Western Utah	183.00
California	165.00
Super Duty	
Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00-168.00

Silica cement, net ton, bulk, Latrobe	29.75
Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

## Chrome Brick

Standard chemically bonded, Balt.	per net ton \$105.00
Standard chemically bonded, Curt-ner, Calif.	115.00
Burned, Balt.	99.00

## Magnesite Brick

Standard Baltimore	\$131.00
Chemically bonded, Baltimore	116.00

## Grain Magnesite

St. to 1/4-in. grains	
Domestic, f.o.b. Baltimore in bulk	\$73.00
Domestic, f.o.b. Chewahall, Wash., Lunenburg	46.00
In sacks	52.00-54.00

## Dead Burned Dolomite

Per net ton	
F.o.b. bulk, producing points in: Pa., W. Va., Ohio	\$16.75
Missouri Valley	15.00
Midwest	17.00

## MERCHANT WIRE PRODUCTS

F.o.b. Mill	Cul	Cul	Cul	Cul	Cul	e/lb.	e/lb.
Alabama City R3	173	187	212	193		9.00	9.55
Aliquippa J3**	173	190		190		9.00	9.675
Atlanta A6**	175	192		214	198	8.75	9.425
Bartonsville K2**	175	192	178	214	198	9.10	9.775
Buffalo W6						9.00	9.55*
Chicago N4**	173	190	172	212	196	8.65	9.325
Chicago R3						9.00	9.55
Cleveland A6							
Cleveland A5						9.00	
Crawford M4**	175	192		214	198	8.75	9.425
Danvers, Pa. A5	173	187		212	193	9.00	9.55
Duluth A5	173	187		212	193	9.00	9.55
Fairfield, Ala. T2	173	187		212	193	9.00	9.55
Galveston D4	9.10						
Houston S2	178	192		217	198	9.25	9.80
Jacksonville M4	184-1	197		219	203	9.00	9.675
Johnstown B3**	173	190	172		196	8.65	9.325
Joliet, Ill. A5	173	187		212	193	9.00	9.55
Kokomo C9	175	189		214	195*	9.10	9.65*
Los Angeles B2**						9.95	10.625
Kansas City S2*	178	192		217	198*	9.25	9.80
Minneapolis C6	178	192	177	217	198	9.25	9.80
Monessen P6						8.65	9.20
Palmer, Mass. W6						9.30	9.85*
Pittsburgh, Cal. C7	192	210		213		9.60	10.15
Rankin, Pa. A5	173	187		213		9.00	9.55
So. Chicago R3	173	187		213		8.65	9.20
S. San Fran. C6				236		9.95	10.50
Sparrows Pt. B3**	175			214	198	8.75	9.425
Struthers, O. Y1*						8.65	9.30
Worcester A5	179					9.30	9.85
Williamport S5							

\* Zinc less than .10%. \*\* 10¢ zinc.  
 \* 11-12¢ zinc. † Plus zinc extras.  
 ‡ Wholesalers only.

## C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT				
	0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. T8	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. W12		10.70	12.90	15.90	19.30
Boston T8	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. K7	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. S9	8.95	10.40	12.60	15.60	18.55
Cleveland A5	8.95	10.40	12.60	15.60	18.55
Dearborn S1	8.05	10.50	12.70		
Detroit D1	8.05	10.50	12.70	15.70	
Detroit D2	8.05	10.50	12.70		
Dover, O. G4	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. M8	9.05	10.40	12.60		
Franklin Park, Ill. T8	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. C11		12.90	15.10	19.30	
Indianapolis R5	9.10	10.55	12.60	15.60	18.55
Los Angeles C7	11.15	12.60	14.80	17.80	
New Britain, Conn. S7	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. B4	8.95	10.40	12.60		
New Haven, Conn. D1	9.40	10.70	12.90	15.90	
Pawtucket, R. I. N7	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. A1	8.05	10.40	12.60	15.60	18.55
Sharon, Pa. S1	8.95	10.40	12.60	15.60	18.55
Trenton, R6	10.70	12.90	15.10	19.30	
Wallingford W1	9.40	10.70	12.90	15.90	18.85
Warren, Ohio T4	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. A5	9.50	10.70	12.90	15.90	18.85
Youngstown R5	9.10	10.55	12.60	15.60	18.55

## BOILER TUBES

Size	Seamless	Elec. Weld
8 per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill		
OD-In.	B.W. Gs.	H.R. C.D. H.R.
Babcock & Wilcox		
2 1/2	13	40.28 47.21 35.22
3	12	54.23 63.57 47.43
3 1/2	12	62.62 73.40 54.77
4	11	73.11 85.70 63.93
4 1/2	10	97.08 113.80 85.53
National Tube		
2 1/2	13	40.28 47.21 35.22
3	12	54.23 63.57 47.43
3 1/2	12	62.62 73.40 54.77
4	11	73.11 85.70 63.93
4 1/2	10	97.08 113.80 85.53
Pittsburgh Steel		
2 1/2	13	40.28 47.21 35.22
3	12	54.23 63.57 47.43
3 1/2	12	62.62 73.40 54.77
4	11	73.11 85.70 63.93
4 1/2	10	97.08 113.80 85.53

## METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots for minus 100 mesh

Swedish sponge iron, 98+ % Fe, f.o.b. Camden or Riverport, N. J., 100 mesh, freight allowed east of Miss. River, ocean bags, 23,000 lbs. and over	10.5¢
Domestic sponge iron, 98+ % Fe, f.o.b. Riverport, N. J., 100 mesh, freight allowed east of Miss. River, 100 lb. bags	10.5¢
100 mesh, cutting and scarring grade, 100 lb. bags	8.5¢
40 mesh, 100 lb. bags	7.7¢
Canadian sponge iron, del'd in East, carloads	10.5¢
Atomized iron powder, 98% + Fe, 40 mesh, F.O.B. Easton, Pa., in 100 lb. bags	7.7¢
Atomized iron powder, 98% + Fe, F.O.B. Easton, Pa., in 100 lb. bags—RZ-365—Freight allowed east of Miss. River	10.5¢
Atomized iron powder, 98% + Fe, Cutting and scarring grade, F.O.B. Easton, Pa.	8.5¢
Electrolytic iron, annealed, imported 99.5+ % Fe	24.5¢
200 mesh	33.0¢
Electrolytic iron, unannealed minus 325 mesh, 99+ % Fe	57.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+ % Fe	88.0¢ to 12.85¢
Aluminum, freight allowed	38.0¢
Brass, 5000 lb. lots	31.0¢ to 46.7¢
Copper, electrolytic	41.0¢
Copper, atomized	39.8¢ to 48.3¢
Chromium, electrolytic, 99.85% min. Fe 0.3 mix, Del'd	\$5.00
Lead, f.o.b. Hammond, Ind. (2000 lbs. or more)	19¢
Manganese f.o.b. Extron, Pa.	46.0¢
Molybdenum, 99%	\$3.60 to \$3.95
Nickel	\$1.05 to \$1.13
Solder powder	13¢ plus met. value
Stainless steel, 302	\$1.07
Stainless steel, 316	\$1.26
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh) \$3.15 (nominal) inc, 5000 lb & over	17.5¢ to 30.7¢
Bronze	47.2¢ to 51.5¢
Nickel Silver	48.8¢ to 53.5¢

## BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
1/4" and smaller x 6" and shorter	49	54	58	57
5/8" thru 1" x longer than 6"	35	40	43	48
Roll thread carriage bolts 1/4" & smaller x 6" and shorter	49	54	58	57
Lag, all diam. x 6" & shorter	49	54	58	57
Lag, all diam. longer than 6 in.	39	44 1/2	47	48 1/2
Plow bolts, 1/4" and smaller x 6" and shorter	49	54	58	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
3/4 in. or smaller	60 1/2
1/2 in. to 1 in. inclusive	55 1/2
1 1/4 in. to 1 1/2 in. inclusive	58 1/2
1 1/2 in. and larger	53 1/2

C. P. Hex, reg. & hvy.	Full case or Keg price
3/4 in. and smaller	60 1/2
1/2 in. to 1 1/2 in. inclusive	55 1/2
1 1/4 in. and larger	53 1/2

Hot Galv. Hex Nuts (All Types)	Full case or Keg price
3/4 in. and smaller	46 1/2

Semi-finished Hex Nuts	Full case or Keg price
3/4 in. or smaller	60 1/2
1/2 in. to 1 1/2 in. inclusive	55 1/2
1 1/4 in. and larger	53 1/2

(Add 25 pct for broken case or keg quantities)

Finished	Base per 100 lb
3/4 in. and smaller	63

Rivets	Base per 100 lb
1/2 in. and larger	\$12.25
7/16 in. and smaller	19

Pct. Off List

## Cap Screws

Discount (Packages)

Full Finished H. C. Heat Treat

New std. hex head, pack-aged		
5/8" diam. and smaller x 6" and shorter	40	26
3/4" 7/8", and 1" diam. x 6" and shorter	22	3
5/8" diam. and smaller x longer than 6"	8	+13
3/4" 7/8", and 1" diam. x longer than 6"	+6	+32
		C-1018 Steel Full-Finished Cartons Bulk
1/4" through 5/8" dia. x 6" and shorter	58	49
3/4" through 1" dia. x 6" and shorter	45	33
Minimum quantity—1/4" through 3/8" diam., 15,000 pieces; 1/16" through 5/8" diam., 5,000 pieces; 3/4" through 1" diam., 2,000 pieces.		

## Machine Screws & Stove Bolts

Plain Finish	Discount	Mach. Stove
Cartons		Screws Bolts
Bulk	Quantity	
To 1/4" diam.	25,000-and over	60
incl.		
5/16 to 1/2" diam.	15,000-200,000	60
incl.		

## Machine Screws & Stove Bolt Nuts

In Cartons	Discount	Hex Square
		Quantity
		16 19
In Bulk		
3/4" diam. & smaller	25,000-and over	15 16

## STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery Charge	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
		Hot-Rolled (16 ga. & hvy.)	Cold-Rolled (16 ga.)	Galvanized (16 ga.)	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.64	8.97	9.05	9.01	10.68				
Baltimore	\$1.10	8.10	9.00	9.78	8.80	8.76	8.60	8.75	11.80*	16.28	15.28	19.83	19.08
Birmingham		8.18	9.45	10.46	8.51	8.89	9.00	8.99					
Boston	\$1.10	9.48	10.54	11.55	9.84	10.17	10.13	10.26	13.49*	16.81	15.81	20.21	19.56
Buffalo	\$1.15	8.40	9.15	11.22	8.90	9.35	9.40	9.30	11.60*	16.34	15.55	19.01	19.30
Chicago	\$1.15	8.35	9.60	10.25	8.66	9.04	9.15	9.14	9.30	16.20	15.20	19.70	18.95
Cincinnati	\$1.15	8.49	9.65	10.60	8.98	9.42	9.71	9.46	11.60*	16.52	15.52	20.02	19.27
Cleveland	\$1.15	8.33	9.60	10.35	8.78	9.28	9.54	9.25	11.40*	16.31	15.31	19.81	19.06
Denver	\$2.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19				20.84
Detroit	\$1.15	8.58	9.85	10.60	9.03	9.41	9.71	9.45	9.66	15.46	15.48	18.81	19.33
Houston		8.10	8.60		8.15	8.45	8.05	8.10	11.10	16.20	15.25	19.65	18.95
Kansas City	\$2.20	9.02	10.27	10.82	9.33	9.71	9.82	9.81	10.22	20.62	15.47	20.02	19.27
Los Angeles		8.70	11.20 11.80	12.15	9.15	9.10	9.00	9.10	12.95	17.05	16.10	21.05	20.60
Memphis	\$1.15	8.55	9.80		8.60	8.93	9.01	8.97	12.11*				
Milwaukee	\$1.15	8.48	9.73	10.38	8.80	9.18	9.37	9.28	9.54	16.34	15.34	19.84	19.09
New York	\$1.10	8.97	10.23	10.66	9.74	9.87	9.84	10.09	13.31*	16.16	15.60	20.10	19.35
Norfolk	\$2.20	8.20			8.90	8.65	9.20	8.90	10.70				
Philadelphia	\$1.10	8.10	10.00	11.27	8.80	8.85	8.60	8.75	12.05*	16.58	15.58	20.03	19.33
Pittsburgh	\$1.15	8.33	9.60	10.60	8.76	9.05	9.15	9.14	11.40*	16.20	15.20	19.70	18.95
Portland		10.00† 8.60	11.75‡ 9.95	13.30‡ 11.05	11.95‡	11.50‡	11.10‡	9.85‡	16.00	18.50	17.45	20.75	20.25
San Francisco	\$1.10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16.10	21.05	20.35
Seattle		9.95	11.15	12.20	10.00	9.70	9.80	10.10	14.70	17.15	16.80	20.65	20.60
Spokane	\$1.15	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.85		16.95	21.55	20.75
St. Louis	\$1.15	8.69	9.94	10.61	9.04	9.42	9.63	9.52	9.93	16.58	15.58	20.08	19.33
St. Paul	\$1.15	8.94	10.19	10.86	8.99	9.45	9.53	9.70‡	9.81		15.41		19.33

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. \*\*All sizes except 18 and 16 gage.  
† 10¢ zinc. ‡ Deduct for country delivery. \* C1018—1 in. rounds. † 10 ga. x 36" x 120"; 20 ga. x 36" x 120"; 26 ga. x 30" x 96"; 4 1/2" x 1" in lots of 1000 to 9999; † sheared plate 1/4" x 84" in lots of 1000 to 9999; ‡ 3" x 5.70" in lots of 1000 to 9999; † M-1020—1-in. rounds in lots of 1000 to 9999.

(Effective Sept. 15, 1958)

## ELECTROPLATING SUPPLIES

### Anodes

(Cents per lb, fct allowed in quantity)

Copper	
Roller elliptical, 18 in. or longer, 5000 lb lots	40.00
Electrodeposited	32.75
Brass, 80-20, ball anodes, 2000 lb or more	45.50
Zinc, ball anodes, 2000 lb lots (for elliptical add 1¢ per lb)	16.50
Nickel, 99 pct plus, rolled carton, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.55
Tin, ball anodes \$1.13 per lb (approx.)	

### Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	68.70
Copper sulphate, 100 lb bags, per cwt.	22.15
Nickel salts, single, 100 lb bags	36.00
Nickel chloride, freight allowed, 300 lb	42.00
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	24.05
(Philadelphia price 24.50)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum	48.00
N. Y.	
Chromic acid, flake type, 10,000 lb or more	30.44

## CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.7
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. B6	68.00	68.50	69.00	69.50	
Birmingham R3	62.00	62.50*	63.00	63.50	
Birmingham W9	62.00	62.50*	63.00	63.50	
Birmingham U4	62.00	62.50*	63.00	63.50	
Buffalo R3	66.00	66.50	67.00	67.50	
Buffalo H1	66.00	66.50	67.00	67.50	
Buffalo W6	66.00	66.50	67.00	67.50	
Chester P2	66.50	67.00	67.50	68.00	
Chicago I4	66.00	66.50	67.00	67.50	
Cleveland A5	66.00	66.50	67.00	67.50	71.00†
Cleveland R3	66.00	66.50	67.00	67.50	
Duluth I4	66.00	66.50	67.00	67.00	71.00†
Erie I4	66.00	66.50	67.00	67.00	71.00†
Everett M6	67.50	68.00	68.50	69.00	
Fontana K1	75.00	75.50	76.00	76.50	
Geneva, Utah C7	66.00	66.50	67.00	67.50	
Granite City C2	67.50	68.00	68.50	69.00	
Hubbard Y1	66.00	66.50	67.00	67.50	
Ironton, Utah C7	66.00	66.50	67.00	67.50	
Midland C11	66.00	66.50	67.00	67.50	
Minnequa C6	68.00	68.50	69.00	69.50	
Monessen P6	66.00	66.50	67.00	67.50	71.00†
Neville Is. P4	66.00	66.50	67.00	67.50	
N. Tonawanda T1	66.00	66.50	67.00	67.50	
Sharpville S3	66.00	66.50	67.00	67.50	
So. Chicago R3	66.00	66.50	67.00	67.50	
So. Chicago W8	66.00	66.50	67.00	67.50	
Swedeland A2	68.00	68.50	69.00	69.50	
Toledo I4	66.00	66.50	67.00	67.50	73.00
Troy, N. Y. R3	68.00	68.50	69.00	69.50	
Youngstown Y1	66.00	66.50	67.00	67.50	

**DIFFERENTIALS:** Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, \$2 per ton for 0.50 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Add \$1.00 for 0.31-0.69 pct phos.

**Silvery Iron:** Buffalo (6 pct), H1, \$79.25; Jackson J1, I4 (Globe Div.), \$78.00; Niagara Falls (15.01-15.50), \$101.00; Keokuk (14.01-14.50), \$103.50; (15.51-16.00), \$106.50. Add \$1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add \$1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.), \$64.00. Add \$1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

## STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingot, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	30.25	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	28.25	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	33.75	33.75	34.25	34.25
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50	61.50	32.00	32.00	32.50	32.50

### STAINLESS STEEL PRODUCING POINTS:

**Sheets:** Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J2; Baltimore, Md.; Middletown, O., A7; Massillon, O., R3; Gary, Ind., U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Detroit, M2; Louisville, O., R3.

**Strip:** Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Leechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, M2; Canton, Massillon, O., R3; Harrison, N. J., D3; Youngstown, R3; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (plus further conversion extras); W1 (25¢ per lb. higher); New Bedford, Mass., R6; Gary, Ind., U1 (25¢ per lb. higher).

**Bar:** Baltimore, A7; S. Domingue, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1; F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; S. Chicago, Ill., U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T3, R3; Ft. Wayne, Ind., I4; Detroit, R3; Gary, Ind., U1; Owensboro, Ky., G5; Bridgeport, Conn., N8.

**Wire:** Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, Ind., I4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, Pa., U1; Syracuse, C11; Bridgeville, U2; Detroit, R3.

**Structurals:** Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, Ill., U1.

**Plates:** Baltimore, F1; Brackenridge, Pa., A3; Chicago, Ill., U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C15; Vandergrift, Pa., U1; Gary, Ind., U1.

**Forging billets:** Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R3; Munhall, Pa., S. Chicago, Ill., U1; Owensboro, Ky., G5; Bridgeport, Conn., N8.

(Effective Sept. 15, 1958)

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# FERROALLOY PRICES

## Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, 30-1.00% max. Si			
0.02% C.....	41.00	0.50% C.....	38.00
0.05% C.....	39.00	1.00% C.....	37.75
0.10% C.....	38.50	1.50% C.....	37.50
0.20% C.....	38.25	2.00% C.....	37.25
4.00-4.50% C, 60-70% Cr, 1-2% Si.....	28.75		
3.50-4.00% C, 57-64% Cr, 2.00-4.50% Si.....	27.50		
0.025% C (Simplex).....	36.75		
0.10% C, 52-57% Cr, 2.00% max Si.....	37.50		
7-8 1/2% max C, 50-55% Cr, 3-6% max Si.....	22.50		
7-8 1/2% max C, 50-55% Cr, 3% max Si.....	25.00		

## High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

## Chromium Metal

Per lb chromium, contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe	
0.10% max. C.....	\$1.31
0.50% max. C.....	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe.....	1.40

## Electrolytic Chromium Metal

Per lb of metal 2" x D plate (1/4" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.	
Carloads.....	\$1.29
Ton lots.....	1.31
Less ton lots.....	1.33

## Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed. Price is sum of contained Cr and contained Si.			
	Cr	Si	
Carloads, bulk.....	27.50	14.20	
Ton lots.....	32.75	15.65	
Less ton lots.....	34.35	17.30	

## Calcium-Silicon

Per lb of alloy, lump, delivered, packed, 30-33% Cr, 60-65% Si, 3.00 max. Fe.	
Carloads.....	25.65
Ton lots.....	27.95
Less ton lots.....	29.45

## Calcium-Manganese-Silicon

Cents per lb of alloy, lump, delivered, packed, 16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads.....	24.25
Ton lots.....	26.15
Less ton lots.....	27.15

## SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe 1/2 in. x 12 mesh.	
Ton lots.....	21.15
Less ton lots.....	22.40

## V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.	
Carload lots.....	18.45
Ton lots.....	19.35
Less ton lots.....	21.20

## Grophidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Carload packed.....	19.20
Ton lots to carload packed.....	21.15
Less ton lots.....	22.40

## Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point		Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.....		12.25
Johnstown, Pa.....		12.25
Neville Island, Pa.....		12.25
Sheridan, Pa.....		12.25
Philo, Ohio.....		12.25
S. Duquesne.....		12.25
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.		
Briquets, delivered, 66 pct Mn:		
Carloads, bulk.....		14.80
Ton lots packed in bags.....		17.20

## Spiegeleisen

Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa.	
Manganese.....	Silicon
16 to 19%.....	3% max.....
19 to 21%.....	3% max.....
21 to 23%.....	3% max.....

## Manganese Metal

2 in. x down, cents per pound of metal delivered.	
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.....	45.75
Carload, packed.....	47.25
Ton lots.....	

## Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	
Carloads.....	34.00
Ton lots.....	36.00
250 to 1999 lb.....	38.00
Premium for Hydrogen removed metal.....	0.75

## Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn.....	
	25.50

## Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, del'd Mn 85-90%.			
	Carloads	Ton	Less
0.07% max. C, 0.06% (Bulk).....			
P. 90% Mn.....	37.15	39.95	41.15
0.07% max. C.....	35.10	37.90	39.10
0.10% max. C.....	34.35	37.15	38.35
0.15% max. C.....	32.60	36.40	37.60
0.30% max. C.....	32.10	34.90	36.10
0.50% max. C.....	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si.....	28.60	31.40	32.60

## Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.	
Carloads bulk.....	12.80
Ton lots, packed.....	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet.....	15.10
Packed, pallets, 3000 lb up to carloads.....	16.50

## Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.	
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## Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.			
	Ton lots, packed	Carloads, packed	
96.75% Si, 1.25% Fe.....	24.20	22.90	
98% Si, 0.75% Fe.....	24.95	23.65	

## Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.	
Carloads, bulk.....	7.70
Ton lots, packed.....	10.50

## Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.			
50% Si.....	14.20	75% Si.....	16.40
65% Si.....	15.25	85% Si.....	18.10
	90% Si.....		19.50

## Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.	
Openhearth.....	3.20
Crucible.....	3.30
High speed steel (Primus).....	3.40

## Calcium Metal

Eastern zone, cents per pound of metal, delivered.			
	Cast	Turnings	Distilled
Ton lots.....	\$2.05	\$2.95	\$3.75
100 to 1999 lb.....	2.40	3.30	4.55

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## Alstifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads, bulk.....	10.35¢
Ton lots.....	11.70¢

## Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo.....

	\$1.28
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## Ferrocolumbium, 50-50%, 2 in. x D, delivered per pound contained Cb.....

Ton lots.....	\$4.00
Less ton lots.....	4.05

## Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Sb plus Ta.....

	\$3.80
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## Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.....

	\$1.68
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## Ferrophosphorus, electric, 23-26% P, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$5.00 unitage, per gross ton.....

10 tons to less carload.....	\$120.00
	\$131.00

## Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti.....

	\$1.35
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## Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti.....

	\$1.50
Less ton lots.....	\$1.54

## Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton.....

	\$240.00
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## Ferrotungsten, 1/2 x down packed, per pounds contained W, ton lots delivered.....

	\$2.15 (nominal)
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## Molybde oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa., bags, f.o.b. Washington, Pa., Langeloth, Pa.....

	\$1.41
	\$1.38

## Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.....

Carload, bulk lump.....	18.50¢
Ton lots, packed lump.....	20.50¢
Less ton lots.....	21.00¢

## Vanadium oxide, 86-89% V<sub>2</sub>O<sub>5</sub> per pound contained V<sub>2</sub>O<sub>5</sub>.....

	\$1.38
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## Zirconium, per lb of alloy 35-40% f.o.b. freight allowed, carloads, packed.....

12-15% del'd lump, bulk, carloads.....	9.25¢
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## Boron Agents

### Boroxid, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4% Si 40-45%, per lb contained B.....

2000 lb carload.....	\$5.50
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### Borham, f.o.b. Niagara Falls. Ton lots per pound.....

Less ton lots, per pound.....	45¢
	50¢

### Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.....

Ton lots per pound.....	14.00¢
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### Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.....

F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up.....	.85
10 to 14% B.....	1.20
14 to 19% B.....	1.50
19% min. B.....	

### Grainal, f.o.b. Cambridge, O., freight allowed, 100 lb and over No. 1.....

No. 79.....	\$1.05
	50¢

### Manganese-Boron, 75.00% Mn, 13.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.....

Ton lots (packed).....	\$1.46
Less ton lots (packed).....	1.57

### Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots.....

	2.15
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1*	2000	G.E.	450	132/265	4160/2400
2*	2000	Whse.	720	600	13,500/6900
2	1250	Whse.	720	600	4160/2400
2	1250	G.E.	450	250	4160/2400
2	1000	Whse.	720	600	4160/2400
2	500	Whse.	1200	125/250	4000/2300
1	450	Whse.	1200	250/500	2300
1	300	Whse.	1200	125/250	4000/2300
1*	300	Al.Ch.	1200	250/300	2300
3	200	Whse.	1200	125/250	2300
1	150	Whse.	1200	250	2300
1	150	G.E.	1200	250	4600/2300
2	150	Rel.	1200	125	2300

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1**	2200	Whse.	Mill	600	92/132
8**	1500	Whse.	Rev.	525	600
1**	1250	Al.Ch.	Mill	600	300/600
2**	940	S.S.	Mill	600	800/1000
1**	700	Whse.	Mill	600	143
4**	700	Whse.	Rev.	300/700	143
2**	645	S.S.	Mill	300	1000
1	600	Whse.	Mill	250	110/220
2	600	Al.Ch.	Mill	600	300/600
1	400	G.E.	M.P.C.	270	450
1	300	Whse.	Mill	250	300
2	275	Whse.	QM.660.6	250	425/850
1	175	G.E.	C.D.175-A	245	800/1025
1	125	Whse.	8K-184	250	575/850
1	125	Whse.	8K-180	250	500/1000
1	100	Rel.	461-T	250	1150/1500
1	100	Whse.	8K-183	250	450/1000
1	100	G.E.	CD-175	250	400/1200
1	80	Rel.	651-T	250	375/1150
1	80	El.Dr.	25-R	250	525/1050
1	50/60	Whse.	8K-121	250	500/1500
1*	50	G.E.	CD-175	250	400/1200
2*	30/40	Whse.	8K-131	250	500/1500

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## THE CLEARING HOUSE

# Order Flood Waited At Pittsburgh

Used machinery buyers have carried spending cutbacks too far, Pittsburgh dealers say.

They believe a backlog of unplaced orders is going to break loose.

■ Pittsburgh dealers report a slight improvement in business. They disagree on the extent of the pickup so far but they all agree that a backlog of unplaced orders has got to break loose sooner or later.

"Plants have been making do with what they have," says one dealer. "They have been postponing badly needed replacements. They have tossed out replacement schedules."

**Cuts Too Severe** — A certain amount of this was to be expected in a general slump but dealers feel the spending cutbacks have been unusually severe this year. Steel mills, for example, would normally take advantage of a slow period to make maintenance replacement. A lack of cash has kept this type of work to a minimum over the last six months.

Reflecting this condition, the recent improvement in steel production brought an immediate increase in orders for electrical equipment by the mills. An electrical supplier says his business turned upward August 1, just when the steel operating rate began to climb.

**Plenty of Potential** — The same supplier feels a further brightening of steel prospects would turn loose a big blast of orders. "We have hundreds of quotations out," he

says. "It will only take a little pressure for production and a slight loosening of purse strings to get things rolling."

A supplier of cranes finds less ground for immediate optimism but reports the same kind of potential. Plants have been making do with what they had. They will ask for quotations by a certain date, then postpone action. Actual purchases come only in cases of absolute need.

Suppliers of rolling mill equipment report little change in their business. One dealer says business is still slow, with a high percentage of inquiries for every order.

**Price Inflation Expected** — Another steel mill man detects a slight improvement, both in the domestic market and abroad. He points out that there is still a very certain market for good rolling mill equipment; it's just a question of locating the need. He looks for inflation to continue with prices of used equipment following those of new models.

**Reluctant Mood Lingers**—Business is still spotty for one supplier of fabricating equipment. If anything, August was worse than July. There are plenty of inquiries and even inspections. One bending roll drew prospects from all over the country before being sold to a Southern plant.

But the general mood is one of hesitation. In the general machinery field there is still no buying interest beyond needs for work on hand. In line with the current philosophy of minimum spending, some large corporations are buying used equipment rather than new models.

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10 ton P&H 39' Span 230 Volt D.C.  
10 ton Milwaukee 57' Span 220 Volt D.C.  
10 ton Shaw 48' Span 230 Volt D.C.  
10 ton Whiting 75' Span 220/2/60 A.C.  
10 ton Shaw 120' Span 230 Volt D.C.  
15 ton P&H 50' Span 230 Volt D.C.  
15 ton Northern 54' Span 230 Volt D.C.  
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Low cost metal stampings  
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## Z I N C

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ZINC METALIZING WIRE

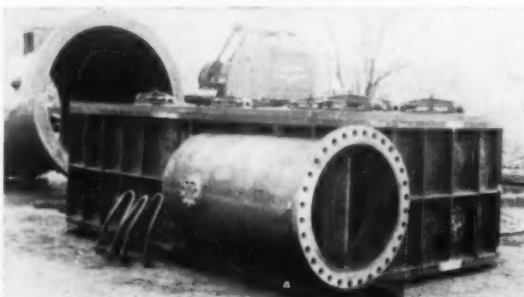
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for electric fuse elements

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creates a CONDENSER WATER BOX



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50 inches  
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18,750 Pounds

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KUTZTOWN FOUNDRY & MACHINE CORP.  
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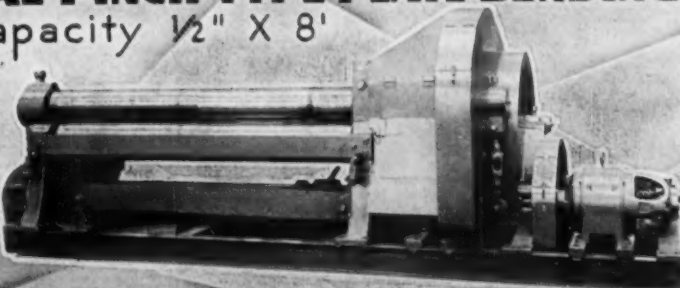
MULTIPLE SPINDLE

CHUCKING MACHINES

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Capacity 1/2" X 8'



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metal, plate and  
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**IT'S WHEELING STEEL**



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Right—Tight coil being opened. Note separator string being threaded into the coil.

Below—Separator string being removed from coil.

# here it is...

**the revolutionary opened coil annealer, designed by Lee Wilson  
...it will substantially reduce costs  
of annealing steel**

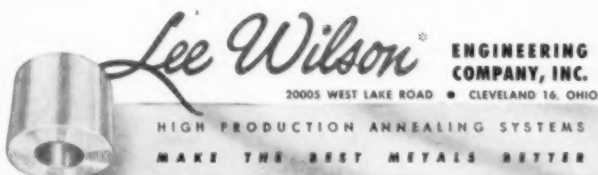


*Methods of opening and handling  
opened coils, heart of New System*

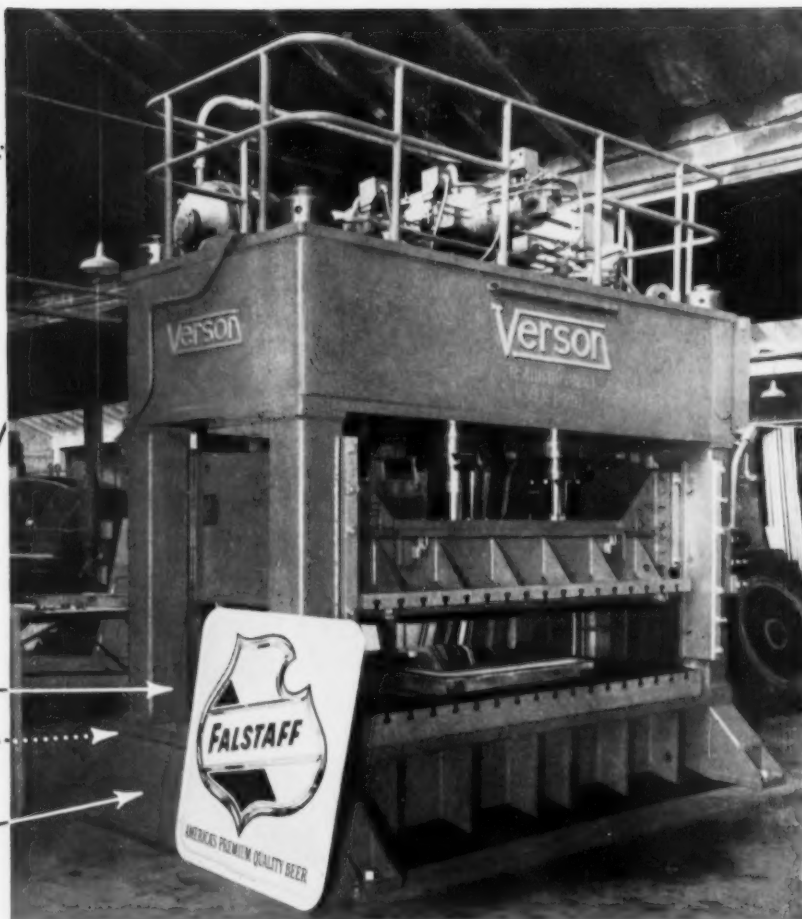
Lee Wilson engineers have developed a method for opening and handling opened coils that makes it possible to expose from 200 to 1000 times the area to heat. This means a faster, more uniform anneal. The new system, further, drastically reduces the expensive process inventory required in the annealing operation. There are many other important advantages to this revolutionary new system. Be sure you have all the facts. Write today for your copy of the Opened Coil Annealer brochure that explains the system in detail.



Opened coil being rewound into a tight coil after annealing.



**Does  
this sign  
look  
familiar  
to you?**



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The press is a three cylinder, shrouded post design with a large platen area, 54" x 108". Stroke of the platen is 24". Bolster area measures 60" x 108". Fast advance is 430" per minute and pressing speed is 39" per minute. Height of the press is 147", so designed because of low ceiling height; floor space is 120" x 137" and the machine weighs 80,000 pounds.

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200-C



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